March 14, 1949

STEEL

The Magazine of Metalworking and Metalproducing

CONTENTS — PAGE 49

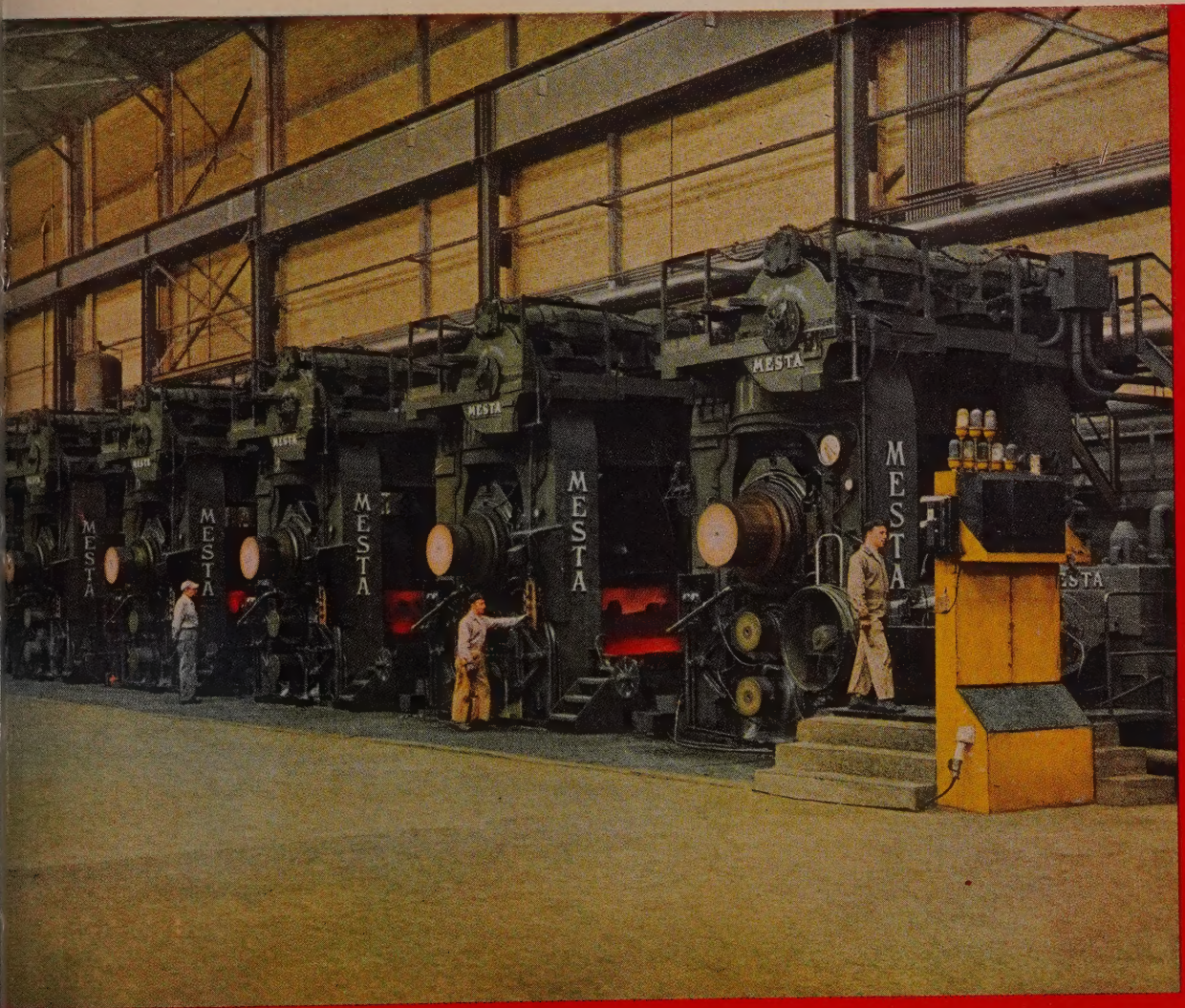
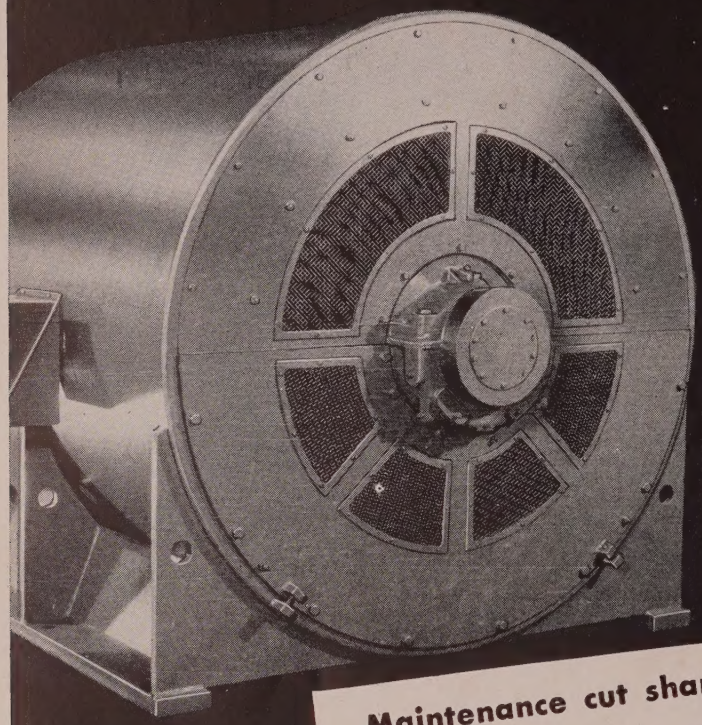


PHOTO BY E. D. MESTA

Mesta 68" Four-High Continuous Hot Strip Mill Finishing Stands



NEW

TUBE-TYPE TOTALLY-ENCLOSED FAN-COOLED

Motors

Maintenance cut sharply on outdoor, corrosive and dirty installations 150 H. P. and up

THE UNIQUE COOLING SYSTEM of the new Allis-Chalmers tube-type, totally-enclosed, fan-cooled motor reduces maintenance to a point never before reached in totally-enclosed motor design. Tubes surround the stator. Internal fans circulate air within the motor to transfer heat to the tubes. An external fan moves outside air through the tubes to remove heat quickly and effectively.

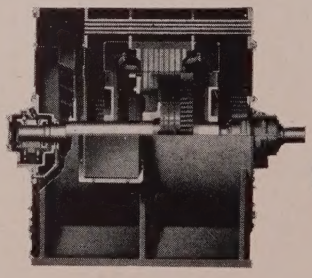
Maintenance Materially Reduced

The new Allis-Chalmers tube-type motor rarely needs cleaning because tubes are straight, the air passages unrestricted, and the cooling air flows at sufficient speed to carry foreign matter out with it. Should unusually dirty air conditions make cleaning desirable, tubes can be swabbed out quickly and easily. This new motor can be installed indoors or out in any atmosphere.

Cooling Efficiency Proved

Three years of successful field operation back up this new motor. For information, on how it can mean lower costs for you, contact your nearest A-C District Office or write for bulletins 51R7149 and 05B7150.

ALLIS-CHALMERS, 1021A SO. 70 ST.
MILWAUKEE, WIS.



HOW TUBE-TYPE COOLING SYSTEM SAVES YOU MONEY ON MAINTENANCE

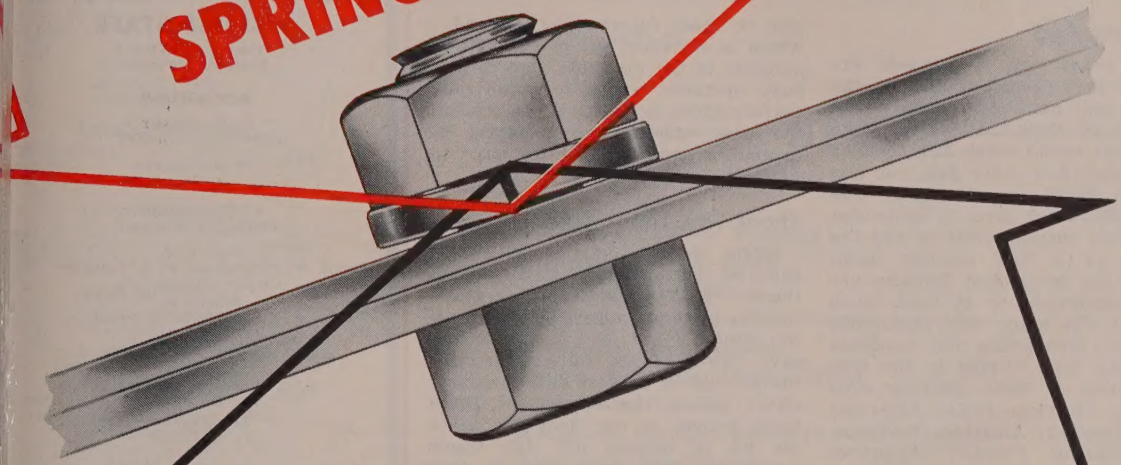
1. **LARGE HEAT TRANSFER AREA** of tubes plus efficient air flow removes heat quickly.
2. **STRAIGHT TUBES** do not normally clog or collect moisture and foreign matter.
3. **INTERNAL FANS** keep enclosed air constantly circulating, assuring even cooling and fast heat dispersal.
4. **EXTERNAL FAN** blows air through tubes to remove heat quickly and efficiently. Air speed keeps tubes clean.
5. **ALL ELECTRICAL PARTS ARE ENCLOSED:** Dirt cannot enter.

A-C ALLIS-CHALMERS

A 2647

ALLIS-CHALMERS

CONCENTRATED SPRING POWER



to keep bolted assemblies under tension – and tighter longer

Reliance Spring Lock Washers offer a dependable method of keeping bolted assemblies tight.

Their helical coil spring design, when compressed, builds up a powerful mechanical reactive pressure between nut or bolt head and the bolted surface. By maintaining bolt tension, this reactive pressure keeps nut or bolt from turning where thread fits are not tight and also automatically compensates for looseness resulting from service wear. Reliance Spring Lock Washers are available with a reactive range adequate to meet every service need.

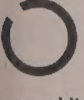
Reliance Spring Lock Washers also act as hardened thrust bearings, reduce surface resistance and permit greater tightening torque.

Extremely simple, they do not depend upon a design which might fail in service and can be used with any type of nut or under bolt heads — cannot damage bolt threads.

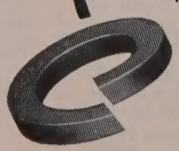
Reliance Spring Lock Washers are available in carbon, alloy or stainless steel, bronze, K-Monel or aluminum.

When product performance and safety depend on bolt tightness, play safe by using Reliance Spring Lock Washers.

EATON SPRINGTITES—Powerful Reliance Spring Lock Washers of proper type and size, permanently pre-assembled on bolts or screws—speed production, cut costs. Write for Eaton Springtite folder.



RELIANCE RINGS—provide strong, heat treated shoulders on shafts or in counter-bores, lock assemblies securely. On in a jiffy, off in a jiffy, they speed production, cut costs. Write for Reliance Ring folder.



RELIANCE *Spring* LOCK WASHERS

EATON

TON MANUFACTURING COMPANY

EATON RELIANCE DIVISION, MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

Behind the Scenes...

Fifty Years Ago

Fifty years ago this week the prophets were predicting that in the greatest bull market in history (up to March 16, 1899, that is) the price of pig iron would reach $20. Today's issue quotes it at over $46, but less than ten years ago the price was around $20, which gives us some idea both of the current inflation and the inflation of a half century back. Some of the same blast furnaces are still in operation, or at least parts of them! The same issue also lists the trusts, monopolies and combines which had been formed in the first two months of 1899, showing such names as American Brass, American Car & Foundry, American Radiator, Royal Baking Powder, American Steel & Wire, and National Tube. The first two months totals have exceeded the entire year of 1898, previously the greatest year in history for such combinations of enterprise.

Social Costs, Coming Up

Associate Editor Walt Campbell is currently up to his ears in the problems being presented as part of the fourth round wage demand. He's finding out a lot about the costs and implications of the social welfare and pension fund demands which are being made as part of the negotiations. We'll shortly publish his results—and you might make a mental note right now that this article should be called to the attention of anybody in your shop who will have to deal with the problem. It's a tough one, and from what we've heard about it, Walt's material will be extremely helpful.

Editorial Developments

Also in preparation upstairs on editorial desks are several other matters which you readers will find of interest. One of these is in this week's issue; it's by Dr. Gray, our expert on finishes, and covers the subject of localized corrosion. Another article this week is on steel specifications, from the viewpoint of a steel producer, and should be of interest to all steel buyers. Next week's issue brings the next instalment of our current series on Fundamentals of Steelmaking—this time it's on Roll Pass Design, prepared by R. F. Beynon, Carnegie-Illinois Steel Corp. Also coming up soon is a new and authoritative article on steelmaking capacity, which will shed considerable light on future expansion to meet future steel demand—which is certainly one of the hottest subjects of the moment. They're real busy upstairs, trying to outdo past performances in bringing you readers the most interesting and helpful information possible—and we have to admit it's an excellent job.

Thank You, Thank You

While we are on the subject of editorial performance, we'd like to thank "Mac" MacNerland, whose column in the Lindberg *Heat Treating Hints*, Vol. 4, No. 3, had this to say, "Few of us fully appreciate the amount of earnest and unceasing effort which the editors of these trade papers in our field put in to the job of helping us". His whole column in that issue was on that subject, and it is nice to find somebody willing to pat our editors on the back in print for the job they do.

Wah-Hoo, Heap Mystery

We are all in a dither, and no doubt you are, too, if you read the ads in last week's book. The entire Indian world is upset. Chief Keokuk is going to get married. It was bad enough trying to figure out if Lonesome Polecat would drive the white man far enough away to suit Minnie Mustache, but this latest development is even hotter. Keokuk's bride has accepted, he's anxiously awaiting the moment, but we don't know who she is! For latest details, keep watching Keokuk's advertising, somewhere in STEEL. From here it looks like a May wedding, but we'll keep our eyes on the hills, and if we intercept any smoke signals, we'll let you know!

Puzzle Corner

We have now received an argument on the answer to the casting problem. Last week we indicated one answer submitted was 26.67 pounds; this week we acknowledge the answer, with proof, of 24.703 pounds. To get that answer, you have to accept the 25-75 analysis as being correct—which it no doubt was. Two weeks ago we proposed the depth of the well problem, which comes out an even 22 feet if you use the fractional value of pi instead of the decimal value. This week we find a farmer who kept cows and chickens. He had 35 altogether, with 78 legs. How many of each did he have? Time limit, 5 minutes. No pencils, please.

Shrdlu

(Editorial Index—page 49)

STEEL

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Editorial Staff on Contents Page

Business Staff on Page 4

NEXT WEEK . . .

Major Changes Expected in Automatic Weighing

Applying Industrial Finishes

How To Select Induction Heating Equipment

Report on Blast Furnace Breakouts

STEEL

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NEWS

TECHNICAL

MARKETS

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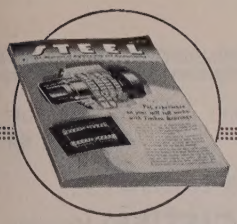
★ Denotes Regular Features.



March 14, 1949

Pay-off for Integrity

For several months observers in the metalworking industries have been witnessing a slackening of new orders, first for one product and then for others, until now there are only a few major products in which demand exceeds supply. Even in the case of the tightest finished steel items, there are signs that a balance between supply and demand will be established much earlier than had been expected.

This means that the shift from a sellers' market to a buyers' market will be completed in the early future. In spite of the fact that this event has been anticipated by almost everybody for several years, it is doubtful whether many companies are fully prepared to deal with it.

For example, in the automobile industry one hears of incidents such as the following: An automobile builder has two dealers in a certain territory. One dealer, who has had no experience in a buyers' market, has asked the manufacturer to hold back his allotment of cars until he can move his present accumulation. The second dealer, with selling experience in a buyers' market, has asked the builder to turn the other dealer's allotment of cars over to him because he can sell them.

During the coming months we are going to witness similar instances in the metalworking industries. After all, there are thousands of companies which have been operating full blast for seven or eight years without any sales effort worthy of the name. Wise managers of some companies have been foresighted enough to prepare their salesmen for the competition that is coming. They will fare better than contemporaries who have neglected or delayed this preparation.

Metalworking companies also are about to submit to another test. In this test, suppliers who have played fast and loose with old customers are going to have a difficult time explaining why they deserve any consideration whatever, now that the buyer is or shortly will be in the driver's seat. On the other hand, the seller who has been careful to treat his customers fairly during the trying times of scarcities will not need to explain.

The days immediately ahead will demonstrate anew that in the long run integrity is more profitable than tricky opportunism.

* * *

POLITICAL ECONOMICS: A few days ago the Joint Committee on the Economic Report approved a drastically diluted report of the President's economic advisors. The vote was strictly on party lines. Seven Democrats with "fair deal" leanings voted for it and four Republicans voted against it.

This incident is of interest to business chiefly for the reason that it shows that under present conditions existing in Washington economics is not an objective science as defined in the dictionary but is a political football. Even the Democrats could not stomach the extremes of the original Truman economic program, so they watered it down to the point where they could approve it without too much strain on their consciences. In the watering-down process they struck out the President's proposal for the entrance of government into the steel business and they hedged considerably on some of his other proposals. The Republicans shied away from every phase of the diluted report.

The present indications that economists on the government payroll are increasingly being forced to temper their honest beliefs by considerations of political expediency are discon-

(OVER)

certing. We cannot believe that Dr. Edwin Nourse endorses even in small degree the unorthodox economic ideas which have been uttered by his associate Keyserling in recent weeks. Nor do we believe several able members of the President's cabinet agree with these queer theories.

The great danger is that the stable minds among the President's council will abandon their posts and that incompetents, gullible to reckless economic theories, will take their places. —p. 60

* * *

URGES DIVERSIFICATION: Interesting comparisons of the growth of facilities of United States Steel Corp. subsidiaries in geographical areas were offered by President Benjamin F. Fairless in an address before the Pittsburgh Chamber of Commerce.

In 1901, when United States Steel was formed, its steel ingot capacity in the greater Pittsburgh district was 6,900,000 net tons; today it is 13,500,000 tons. During the same period, total capacity of the corporation's subsidiaries increased from 10,600,000 to 31,300,000. "Pittsburgh's capacity," he noted, "has nearly doubled, but U. S. Steel's total capacity has virtually tripled. This means that greater gains have occurred in other districts." These gains have been largely in the Chicago district and in the South and Far West.

Mr. Fairless went on to say that Pittsburgh needs a wide variety of plants which utilize steel in the fabrication of their products. "A balanced and diversified economy locally must be matched by a balanced and diversified economy nationally," he said. —p. 61

* * *

ACTIVITY IN ORE, FUEL: Tempo of activity in the raw materials branch of the iron and steel industry is increasing. Operations will begin this week on a new pilot plant for pelletizing iron ore concentrates. This plant, at Ashland, Ky., will use concentrates from the Benson mine in New York.

Exploration by M. A. Hanna Co. reveals the existence of about 300 million tons of iron ore of good grade in its Labrador and Quebec concessions. Meanwhile, officials of the Lake Carriers' Association are meeting with officers of the Coast Guard to consider the possibility of an early opening of the navigation season on the Great Lakes.

Of great interest to the steel industry is the pending contest in the Ohio legislature over the proposal to build a 130-mile conveyor system from Lake Erie to the Ohio river to transport iron ore and coal. —pp. 68, 69

* * *

ENGINEERING SOCIETIES: Machine Tool Editor Guy Hubbard, about to start on the annual round of spring meetings of technical societies, comments on the "fission" of American engineering societies and wonders when this process will end.

He refers, of course, to the tendency of closely-knit groups within established organizations to break away and to form societies of their own. This has been going on for a long time. Up to a certain point, it is the result of the growth of interest in a specialized branch of engineering which seems to justify the formation of a separate organization.

However, as Mr. Hubbard points out, there is a limit to the number of meetings an engineer can attend and there is a limit to the number of associations to which he can afford to pay dues. Perhaps these limitations, in themselves, automatically exercise a necessary restraint against the formation of too many societies. —p. 88

* * *

MODERN STOREKEEPING: Every manufacturer whose business calls for supplying repair or replacement parts to customers will find it profitable to study some of the scientific storekeeping methods that are being adopted here and there throughout the country.

One of the latest is the new diesel locomotive parts center recently installed at the Electro-Motive Division of General Motors at La Grange, Ill. Orders received in the office are prepared on accounting machines. The necessary instruction slips go by pneumatic tubes to the storehouse, which has facilities for housing more than 20,000 parts. The desired parts are placed on conveyor belts which carry them to a consolidating station for shipment. Proper packaging is an important factor in the operation of this parts center. Research is conducted constantly to improve storage, inspection, packaging and shipment.

In many older metalworking plants, management might check to see whether storekeeping methods have kept pace with improvements in production methods. —p. 100

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

POLITICS AND ECONOMICS—Democratic members of the Joint Committee on the Economic Report have approved a watered-down version of the President's anti-inflation program (p. 60), but evaded the issue of government participation in steel and other industrial expansion. The majority report also is vague on the administration's request for a $4 billion tax increase, and several other demands made by Mr. Truman. Republican members of the committee dissented vigorously from even the diluted report of the majority.

AS THE BOOM SUBSIDES—While administration advisers are trying to decide whether inflationary or deflationary forces are dominant in the economy, evidence accumulates in the country that a business readjustment is underway. Unemployment in February continued to climb (p. 57) and reached the highest level since 1942, although it still remains well below prewar levels. Steel supplies continue to ease and the Office of Industry Cooperation is reshuffling the voluntary allocation programs and may effect a 25 per cent reduction in allocated tonnage by June (p. 57). One program which seems likely to lose a substantial tonnage is that for freight cars. New orders virtually disappeared in February and backlogs of builders are declining.

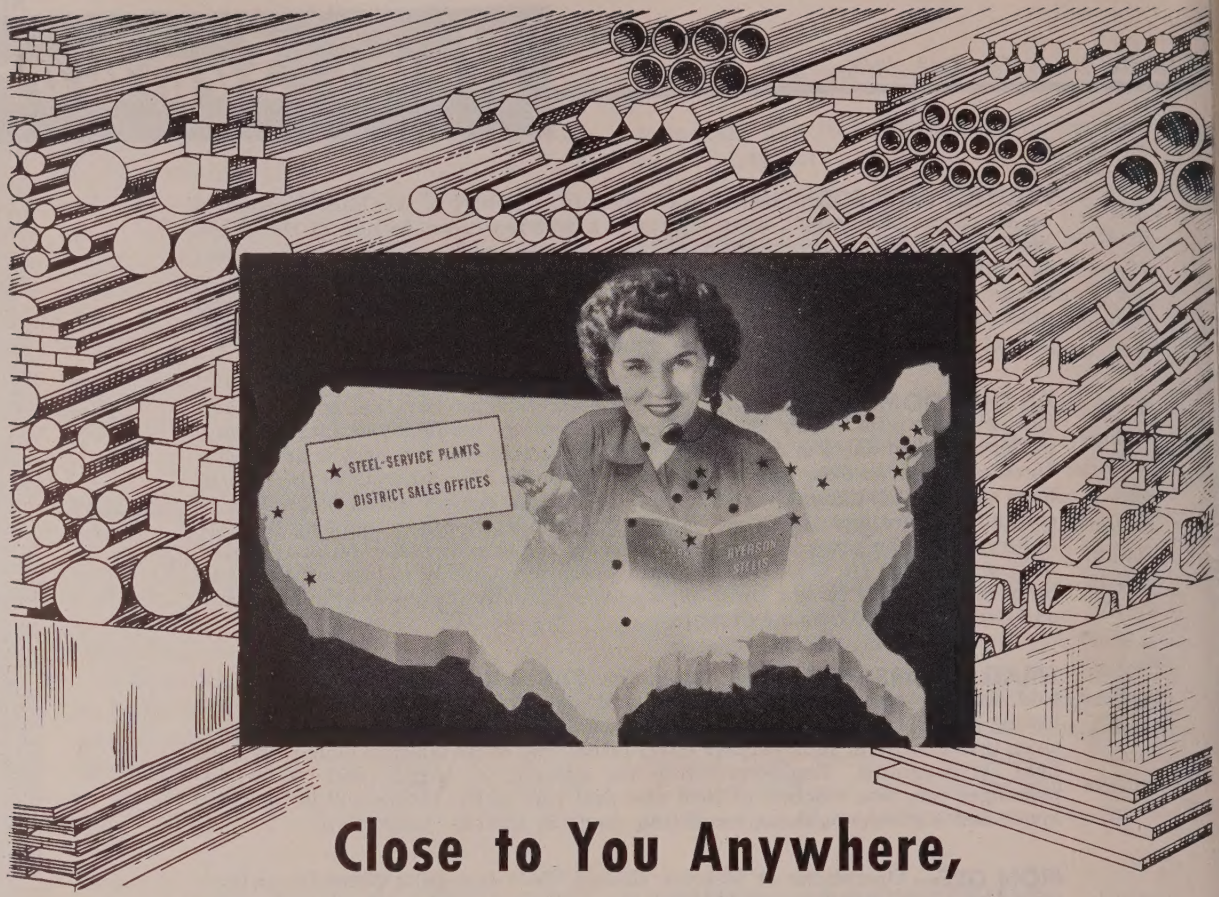
SMALLER CARS—Society of Automotive Engineers members last week were told that the trend is toward shorter and smaller automobiles (p. 62). Following announcement by Chrysler that two of its lines will be offered in smaller sizes, presumably at substantially lower prices, two other builders have activated light car programs. Engineers believe the ultimate in length and width in passenger cars was reached in 1948 and that cars of the future will be shorter, lower and narrower without sacrificing much in interior dimensions.

IRON ORE—Operations at Reserve Mining Co.'s new pilot plant for pelletizing iron ore concentrates at Ashland, Ky., will start within a few days (p. 68). Operators expect to produce about 60,000 tons of pellets in the first year to be used in tests in the blast furnaces of Armco Steel Corp . . . . Exploration by M. A. Hanna Co. has revealed about 300 million tons of high grade ore at its Labrador-Quebec concessions . . . . Ice conditions in the Great Lakes are being watched closely by shippers in anticipation of an early start of the 1949 shipping season. Ore shippers are aiming at a Mar. 25 opening.

TRAP?—Washington observers are wondering whether the Senate labor committee's Democratic majority walked into a trap when they reported out a labor bill along the lines demanded by the President. They suspect that the opponents of the administration bill may be chuckling inwardly because the high-handed tactics of the committee majority has aroused resentment among congressmen (p. 64) which may work against the administration's proposals on the floors of Congress. Meanwhile, the Republicans may have picked up some support from southern Democrats by allowing the filibuster on civil rights to continue.

FOREIGN—Western European countries are watching progress of the new economic directorate which is drawing up a long-range, co-ordinated recovery program for the Marshall Plan nations (p. 67). The commission will study import-export balances of the participating countries and draft recommendations designed to promote trade, financial and monetary stabilization in Europe.

HERE AND THERE IN INDUSTRY—Battle of the belt conveyor system, the "rubber railway" proposed to carry ore and coal from the Great Lakes to the Ohio River, is underway in the Ohio legislature (p. 69). . . . Crucible Steel Co. of America has spent nearly $40 million in expansion and equipment since 1946, and $7.2 million more has been authorized (p. 74) . . . Tool and die interests are awaiting a break in the Fisher Body retooling program (p. 71) . . . .Pittsburgh, while still the major steel producing center, has been losing ground over recent years, and needs growth in steel consuming industries (p. 61) . . . Demand for steel mill equipment is holding up well, says Mesta Machine Co. (p. 74).



Close to You Anywhere, Ryerson Stocks—Ryerson Service

No matter where you are, or where you want steel delivered, there's a Ryerson plant, with diversified Ryerson steel stocks, within quick shipping distance. A network of thirteen big plants, plus twelve district sales offices, makes Ryerson steel service the most comprehensive and convenient in the nation.

Each big Ryerson plant is set up to operate independently with large stocks and high-speed cutting and handling facilities, plus its own complete staff of carbon, alloy and stainless steel specialists. Yet each Ryerson plant and office offers the advantages of a unified organization with a hundred and six years of practical steel experience.

These days, with the record-breaking demand for steel, we may not always have the exact size or quantity you need. But you can be sure we will do our very best to serve you. Usually, from long experience, we are able to suggest an available alternate steel. So, for steel and steel service, call the Ryerson plant or office nearest you.

Need Stainless? . . . Call Ryerson

Your nearby Ryerson plant is a quick, convenient source for everything in stainless steel. Bars, plates, sheets, tubing, pipe and other stainless products in many types and finishes are on hand. And stainless from Ryerson stocks means Allegheny stainless, the time-tested product of America's oldest stainless producer. Need stainless? Call Ryerson.

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STEEL
A PENTON PUBLICATION

Allocations Cutback Forecast

Twenty-five per cent reduction seen by June 1. Freight car builders may lose 125,000 tons monthly as backlogs dwindle and new orders almost disappear

VOLUNTARY steel allocation programs now in effect may be reduced by 25 per cent by June 1. This forecast by the Office of Industry Cooperation indicates an easing in the steel supply situation and hints that some of the beneficiaries under the program do not require all the steel being allocated to them.

For some weeks OIC has been reviewing the various programs with a view to cutting back allocated tonnages where feasible.

OIC says that some of the reductions may be temporary and that tonnage taken from some of the less active programs may be allotted to new programs or to present programs requiring greater tonnage.

Freight Cars Slow—One program which may require less steel than it has been receiving is freight car building. New car orders for February dropped to the lowest level in recent years and amounted to only 332.

Deliveries last month were the third highest since the allocation program was started and totaled 10,315. January output was 8913 cars.

The backlog of car orders as of Mar. 1 totaled 85,974. This compares with 96,464 Feb. 1, and 121,936 on Mar. 1, 1948.

Unless the railroads step up car ordering, the allocation for cars, which has been 250,000 tons monthly, may be cut back as much as 125,000 tons.

Freight car awards by months in recent years:

Freight Car Awards

	*1949	*1948	*1947	*1946	1945
Jan.	1,568	8,613	9,222	1,481	7,200
Feb.	332	10,698	13,724	2,328	1,750
Mar.	....	13,227	12,048	4,512	2,500
Apr.	....	17,215	9,186	3,564	1,120
May	....	2,228	7,389	2,900	1,526
June	....	5,368	12,784	3,335	670
July	....	11,308	14,840	14,836	3,500
Aug.	....	3,638	2,352	9,527	7,240
Sept.	....	738	9,917	11,102	12,840
Oct.	....	10,931	17,737	3,407	1,320
Nov.	....	4,852	8,079	7,190	1,650
Dec.	....	8,368	4,030	3,011	4,116
Total	....	97,184	121,308	67,193	45,432

* American Railway Car Institute.

Traffic Down—Railway traffic and net income is trailing behind last year. For January, the net income of Class I carriers is estimated at $14 million, compared with $19 million in January, 1948. Car loadings are running about 9.6 per cent under 1948.

Estimated freight traffic for the year will be 8.2 per cent below 1948 and passenger traffic will be 11.4 per cent lower, according to testimony by Julius H. Parmelee, director of the Bureau of Railway Economics, Association of American Railroads, before the Interstate Commerce Commission in support of the railroads' application for increased freight rates. Ton-miles for 1949 are estimated at 586 billion, less than any year since 1941 and 20 per cent below the 1944 peak.

As result of the decline in traffic the railroads not only have been holding up orders for new cars but also have furloughed large numbers of employees.

Allocation Programs Extended

CONTINUATION through next September of the voluntary allocation program making 3130 tons of steel products available monthly for maintenance and repair of anthracite mines, and the program providing 100,000 tons of pig iron per month to foundries for manufacture of cast iron residential housing items, has been approved by the secretary of commerce and the attorney general.

Unemployment Up Again

Number looking for jobs rises to postwar peak, but remains well below prewar levels

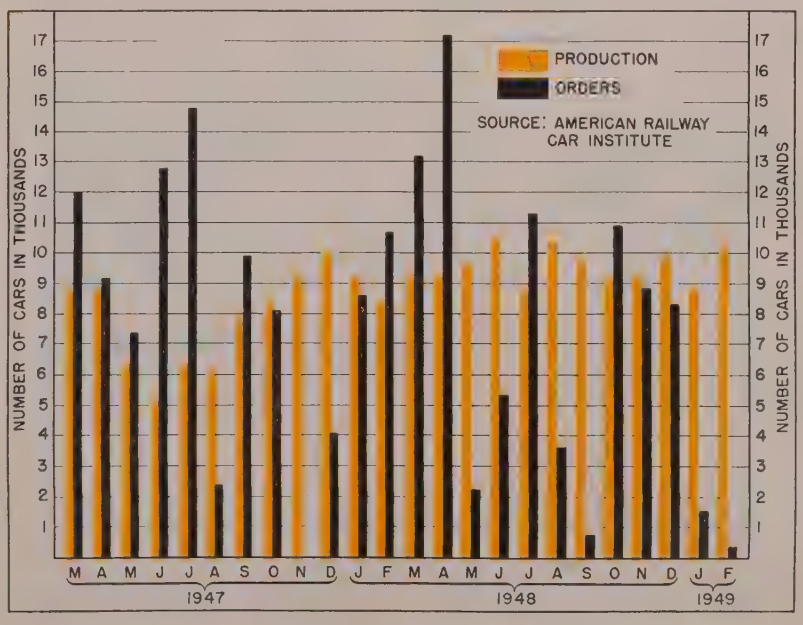
UNEMPLOYMENT in the United States rose by 555,000 in February to 3,221,000, the highest since 1942. The February rise in the number looking for work continues a trend which started last October.

The employment trend is being watched closely by business and government people as an index of business conditions.

Today's unemployment, while at a postwar high, is well below prewar years. As late as 1941, unemployment averaged 5,500,000 and about one out of every 10 persons in the civilian labor force was unemployed. In February, the comparable proportion was about one out of 20.

Appraise Figures Cautiously—Census Bureau officials who collect the unemployment figures say part of the February increase was caused by

FREIGHT CAR ORDERS AND DELIVERIES SINCE MARCH, 1947



FAST MOVE: To minimize interruption to production, Inland Steel Co. moved 120 feet and put into operation its 40-in., five-stand tandem mill in its Indiana Harbor, Ind., Works in less than nine working days. The move permits installation of new power equipment to increase the mill's capacity from 1400 ft of cold-rolled steel sheets and strip per minute to 3900 ft

bad weather in certain sections and by other seasonal developments. However, a large part of the increase was due to nonseasonal layoffs. A drop of about 475,000 in number of nonfarm workers accounted for a major part of the increase in unemployment. The remainder came from an increase in the number of persons seeking work, due in some measure to students entering the labor force after the end of the fall term. Farm employment actually increased in February, a normal seasonal development.

Government officials are cautious in appraising the meaning of the unemployment rise. February figures, they believe, still do not tell the story of whether seasonal factors or business readjustment are dominant in the unemployment rise.

March and April figures will be watched carefully. If the Easter trade and construction resumption, coupled with other spring activities, do not combine to bring employment back up, a business readjustment will be clearly in the picture.

March Trend Uncertain — Spot checks in late February and early March showed a situation too spotty to warrant any conclusions.

More Selectivity in Hiring

WITH labor supply easier today than it has been for a long time past, employers are exercising more selectivity in hiring, reports the Ohio State Employment Service.

Job listings increasingly call for men under 45 years of age and women under 35, which means one out of three men and two out of five women applying to the service for jobs are finding it difficult to get placed in new positions.

Almost three times as many men are looking for jobs as are women, and more than a third of the job seekers are veterans.

Fewer Steel Jobs Offered

EMPLOYMENT opportunities in the steel industry are tightening up, according to the Federal Security Agency. Almost without exception, the only plants that currently anticipate hiring additional workers are those that are installing new facilities which will add another 2.2 million tons to the industry's capacity by 1950.

Even turnover furnishes fewer jobs now than formerly, according to data gathered by the United States Employment Service and affiliated state employment services.

There is recurrent evidence that steel jobs are getting scarcer. One plant reports that for the first time since 1940 it is not hiring any laborers—only a few skilled workers.

Labor Board Upholds Discharge

IN AN unusual labor relations case, the National Labor Relations Board has in effect upheld a company for discharging a steel union member on the ground that the employee who was discharged had engaged in fomenting a strike among plant workers, in violation of a no-strike clause with the union.

The company, Stockham Pipe Fittings Co. of Birmingham, originally had been cited in a complaint by the NLRB, for having discharged an employee, a member of the United Steelworkers of America—CIO. The complaint charged that the company's action grew out of the employee's union activities.

However, the company replied that the employee had been discharged for instigating and encouraging the employees to engage in a strike in violation of a no-strike clause in the company's contract with the union.

The board in effect, sustained this version of the case.

Hints "Safety" Coal Strike

JOHN L. LEWIS may lead his coal miners out of the pits this spring in a strike to emphasize the union's demands for safety in the mines. This was the threat tossed at a Senate committee last week by John Owens, secretary-treasurer of the United Mine Workers and a chief aide to Mr. Lewis, in opposing the confirmation of James Boyd as director of the Bureau of Mines.

State Labor Laws Upheld

TOUGHER restrictions on "union security" contracts than are provided by federal laws may be imposed by the separate states, the U. S. Supreme Court ruled last week.

In a 7 to 2 decision, the court held that neither the Taft-Hartley act nor the Wagner act bans the states from regulating security agreements. The court majority ruled that the only limit on the states is that they shall not impose a policy inconsistent with national policy.

It is significant in this connection that the current administration labor bill now pending in Congress provides for the nullifying of state laws banning the closed or union shop.

In its decision last week the Supreme Court specifically upheld an order of the Wisconsin Employment Relations Board based on a Wisconsin state law which requires that two-thirds of the workers in a plant must vote for maintenance of membership before it is included in an agreement. The Taft-Hartley act permits such agreements when a majority of the workers approve.

The decision of the Supreme Court will leave union leaders in an awkward position if the present move to repeal the Taft-Hartley legislation fails, or is delayed for any great length of time.

While the Supreme Court was rendering its decision upholding state curbs on the closed shop, a House subcommittee was listening to a series of diatribes against former Representative Fred Hartley himself, as

much as against the law bearing his name.

View Economic Prospects

PREDICTIONS as to the long-term stock market outlook made by several analysts at the second annual convention of the National Federation of Financial Analysts Societies were hedged with "ifs" pertaining to the international political scene, the policies of the Truman administration and extent of readjustment of the national economy.

Glenn G. Munn of Paine Webber Jackson & Curtis predicted a leveling-off readjustment by way of transition into a new period of prosperity to begin in the 1950s. He maintained the government's antideflation intent is clear and what matters is when and in what manner it intervenes.

Stock peaks of 1946 to 1948 will not be exceeded in either 1949 or 1950, however, unless Congress provides far-reaching changes in tax laws favorable to equity capital and its formation or unless there is a renewal of deficit financing on a considerable scale or a marked reduction in margin requirements. For 1949, he predicted at least one intermediate upward movement equal to 10 per cent in the averages but ranging to 30 or 40 per cent in specific issues and starting from whatever low is established in the spring months.

Basing his view on the limited amplitude of the industrial average over the past 29 months and the low volume of trading, Justin F. Barbour of Barbour's Dow Theory Service Inc. pictured a market waiting for conditions to clear so that it can resume its major advance. As potentials for another great bull market he listed the earning power of new products, accrued know-how, potentially great demand, a world wide shortage of industrial equipment and a tremendous money supply.

John H. Lewis of John H. Lewis & Co. stated that unless war tension diminishes or disappears, a caution will be engendered in the minds of investors which will prevent a bull market of any important scope.

April Seen Key Month on Trend

APRIL will be the significant month in providing clues to the direction business will take in 1949, according to the monthly letter of the National City Bank of New York. It states that if employment fails to show a vigorous rise, and trade and markets register no improvement the disappointment is likely to produce a fresh wave of hesitation and slackening.

West Coast Steel Eases

Supply-demand pattern changing in area. Delivery time shortens

SHIFTING supply and demand patterns are rapidly changing the West Coast steel picture.

With the exception of plates and sheets, the ability to buy most steel products has become relatively easy, and signs are appearing supply and demand factors in sheets soon may come into parity, unless there is a sharp upturn in business this spring.

Wholesalers report many fabricators now have more sheets than they can use. Some plants are canceling mill orders for new supplies, and others are attempting to sell part of their current stocks.

Paradox—A paradox in this situation is the fact that overall demand is heavier than the supply; the result is that mills still are operating at capacity. However, some shifting at the mill level has appeared.

Henry Kaiser's Fontana mill, which several months ago established price premiums averaging $30 a ton above other western producers, reports it has received some cancellations.

Fabricators, who were questioned on orders being filled by the Fontana plant, say that some offers of earlier delivery are being promised. One user said he was offered sheets for delivery in 30 to 45 days whereas two months ago delivery time was listed at 6 to 9 months.

Cancellations Taken Up—Kaiser executives in Oakland, however, report that orders which have been canceled have been quickly taken up by other users, and no reduction has been made in production, nor is any planned for the immediate future. The mill plans to increase plate output 25 per cent in April.

One other large western steel producer says that several steel items are more plentiful than at any time since the war. It reports wire products as the most ample and immediate delivery can be made on these items. The company also notes some easing in small diameter pipe.

Snow Slows Geneva Operations

HEAVY blizzards in Utah have slowed operations at Geneva Steel Co., the West's largest steel plant.

Deep snows have blocked railroad lines connecting the mines and mill, and iron ore stockpiles have dwindled to only three or four days' supply and all departments have been affected by the curtailment. The mill's three blast furnaces have been curbed about 100 tons daily. Before the slowdown they were producing 900 to 1000 tons of pig daily.

Meantime, Geneva has announced its operations in 1948 established new high production records. Ingot output of its nine open hearths reached a peak of 1,114,174 net tons for the year, compared with the previous record of 965,556 net tons in 1947. Finished steel production last year reached a record 760,649 tons compared with 688,742 tons in 1947. All monthly production records were broken in December when 116,804 tons of ingots were turned out.

HUNTING SCRAP: Scarcity and high prices of scrap now make metal buried in slag piles worth recovering by Colorado Fuel & Iron Corp. at its Minnequa plant, Pueblo, Colo., where bulldozers are shown at work scraping through the slag. The metal ranges from a few pounds to 1000 pounds per piece. The six-mile-long dump will require 25 to 30 years to work over. NEA photo

Economic Group Hedges on Truman Plan

Majority report of joint committee vague on President's proposal for government financing of new steel plants. Avoids endorsement of tax rise. Republican members dissent

PRESIDENT Truman's proposal that the government build steel and other plants if private industry does not come up to needed production received only a half-hearted endorsement from the Democratic members of the Joint Committee on the Economic Report.

The committee suggested there may be need for greater steel capacity but evaded the question as to how the expansion should be provided. By inference, the committee's report reassured industry that the government will not enter directly into production "in steel or any other industry."

The committee reviewed various testimony on the adequacy of steel capacity, by members of the industry and others, and suggested that the industry's contention that there is no cause for worry about steel capacity "may not provide a firm foundation for sound policy."

Committee Hedges—At the same time, the majority report says, "there is no assurance that those not practically engaged in the industry, see the forest any better than those inside it." Only "close and continued study can provide the beginning of an answer" to the steel problem.

"In the meantime," the report reads, "no concrete proposals are even being entertained for government production of extra capacity in steel or any other industry."

The committee suggested vaguely that some premium arrangement, or other provision, for increasing capacity might be worked out, but left the matter open.

Report Toned Down—The committee's report generally reflects a moderate attitude toward the President's 8-point anti-inflation program. It proposes, more by inference than directly, the following:

Mandatory allocation of selected critical materials, particularly metals and metal products.

Maintenance of export controls, recently extended for a year in legislation signed by the President.

Enactment of stand-by price controls, but with a floor no lower than the December, 1948, prices of any goods involved.

Continued or more stringent controls over credit which would affect demand for such items as automobiles and new homes.

Fail to Endorse Tax Increase—The majority report does not directly endorse the President's demand for a $4 billion tax increase, although it does devote considerable space to explaining why more revenue would be desirable.

The committee endorses the long-term slum-clearance and housing bill now before Congress. It finds an increase necessary in minimum wages because of the "enormous increase in the cost of living." Likewise, it believes social security should be expanded and old-age and survivors benefits increased substantially. "Flexible, well-integrated and varied" farm price program is needed, the committee says, adding that Congress also should consider more crop storage space, crop insurance, and more credit for farmers.

Republicans Dissent—Against support of the President's program is ranged some formidable opposition, particularly by Sen. Robert A. Taft (Rep., O.) and Sen. Ralph E. Flanders (Rep., Vt.). Senator Flanders wrote a dissent, in which Rep. Christian A. Herter (Rep., Mass.) concurred, which contended that the majority report's "insistence on the danger of inflation and the assumption that we are having both inflation and deflation simultaneously seems a bit ingenuous." They asked: "Is it not a rationalization of desire to have the powers of allocation and price control granted the administration?"

Senator Taft said he views many of the committee's recommendations as "definitely unnecessary and harmful" and said that they tend to create executive powers "which could bring about a completely regimented economy and completely regimented people."

Says Warehouse Stocks Short

WHILE reports indicate an easing supply of steel in some quarters, there has been no improvement in stocks of independent warehouse members of the Association of Steel Distributors Inc., according to Harold Weinstein, president of the association, and head of the Calumet Iron & Supply Co., East Chicago, Ind.

Commenting at the sixth annual meeting of the association in New York city, he explained the independent distributor members of his organization were still short of many types of steel, but asserted that warehouses affiliated with steel mills had considerably augmented their stocks in recent weeks. He remarked that steel is still in good demand, although customers are becoming more selective in their purchases.

J. I. Baron, Baron Steel Co., Toledo, O., said some refrigerator manufacturers who had canceled orders earlier this year had reappeared in the market for steel. He named sheets, plates, structurals, pipe and bars as in extremely short supply among the independent warehouses.

National officers were re-elected to serve a second term. These are Harold Weinstein, president; Joseph B. Brown, Erie Steel Co. Inc., Philadelphia, and Lester Finkelstein, Finkelstein Supply Co., Los Angeles, vice presidents; Louis Goodwin, Eastern Steel & Metal Co., New Haven, Conn., secretary; and William Fabricant, Fabricant Products Inc., New York city, treasurer.

Need Steel for Construction

SHORTAGE of steel may seriously delay both private and public construction and seems certain of being the principal materials problem this year, according to a survey by Associated General Contractors of America, Washington. Almost every form of steel used by construction firms is in short supply in many sections of the country, although some improvement in deliveries has been noted.

Among the items reported as being tight are: Structural steel, cast iron pipe, sheet steel, steel cylindrical pipe, nails, reinforcing steel and road mesh.

The cement situation is reported to be greatly improved although it is still fairly tight.

Considerable improvement has also been noted in the availability of skilled workmen in nearly all parts of the country.

Rockwell Foresees Ample Steel

RAPID change in availability of steel as experienced by Standard Steel Spring Co., Coraopolis, Pa., came up for comment by Col. W. F. Rockwell, board chariman, at a recent press conference in Chicago.

After stating that the steel shortage is "pretty well over," Colonel Rockwell amplified his remark for STEEL with the explanation the company in the final two quarters of last year had been told first that its mill allocations of high carbon spring steel would be cut 20 per

cent in first quarter, then that it would remain unchanged, and finally that it would be increased 20 per cent.

He went on to say that a steel mill official had expressed to him his belief that the Commerce Department's estimate of the excess of total demand over supply of steel in 1949 was completely wrong, the excess to be in favor of supply by the end of the year.

Pittsburgh Loses Ground

Area still leading steel producer but needs more diversified consuming industries

PITTSBURGH still is the world's largest steel producing center but it has been losing ground over recent years because with its relatively large capacity it has had to reach out farther for tonnage, according to Benjamin F. Fairless, president, United States Steel Corp.

Addressing the Pittsburgh Chamber of Commerce, he said the best remedy for the situation is a growth in the local district steel consuming market, which can come only through further diversification of the district's industry.

In the period 1901-1949, he pointed out, U. S. Steel's capacity rose from 10,600,000 net tons to 31,300,000 tons, an increase of 20,700,000. In 1901 U. S. Steel had 6,900,000 tons of capacity in the greater Pittsburgh district, including Youngstown and Johnstown. Today its Pittsburgh capacity totals around 13,500,000 tons, a gain in the period of 6,600,000 tons.

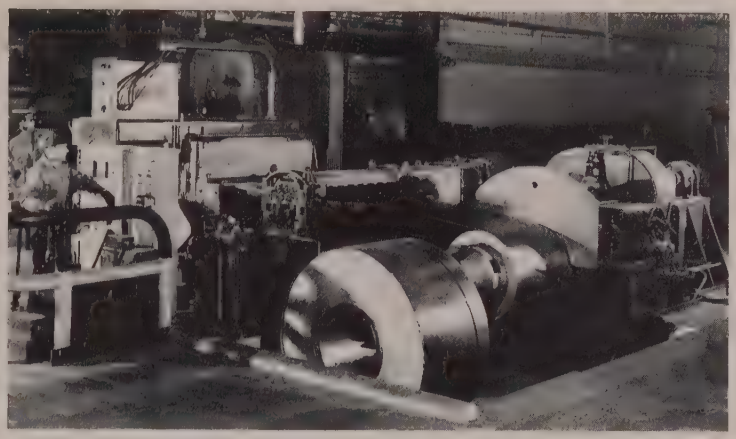
Greater Gains Elsewhere—Significantly, however, while U. S. Steel's capacity has virtually tripled in the period, its Pittsburgh district capacity has only about doubled, which means that greater gains have occurred in other districts.

In the Chicago district, including Gary and Duluth, U. S. Steel's capacity has risen from approximately 1,900,000 tons to 10,900,000 tons, an increase of 9 million. In the Cleveland-Lorain district, capacity has advanced from around 1,400,000 tons to 1,900,000. In the South and the Far West, including Utah and California, where U. S. Steel had no capacity in 1901, it now has capacities of 2,900,000 and 1,900,000 tons respectively.

Diversification of Pittsburgh industry and enlargement of its steel consuming facilities are essential if the area is to hold its position, he said, and he pointed to the fact that over the recent past new arrivals in the city include three automotive plants, and a large can manufacturing plant, while many other companies are considering relocating or are contemplating building branch plants in the area.

Added Reason — "Uncertainties arising from the basing point decision have provided steel fabricators with an added reason for considering the movement of their plants to steel producing centers," he said. "This prospective relocation of plants affords a great opportunity to steel producers in the Pittsburgh district.

"Regardless of what may happen to basing points, Pittsburgh must enlarge its local steel consuming market."



INTO FULL PRODUCTION: This new continuous terne-coating line at the Gary, Ind., sheet and tin mill of Carnegie-Illinois Steel Corp. has moved out of the experimental stage into full production. The 260-foot line employs a new electrolytic pickling bath and is capable of coating coils up to 48 in. wide and weighing up to 48,000 pounds

Sharon Integration Proceeds

SHARON Steel Corp. spent nearly $11.5 million last year on plants and equipment in a program to integrate its operations more fully, to diversify its products more widely and to process a greater percentage of semi-finished steel into more highly finished products.

The company spent more than $22 million during the past three and one-half years on expansions and improvements, and an additional $4 million will be used in 1949 to complete the program. Major plant acquisition during 1948 was the 60-oven by-product coke facility at Fairmont, W. Va., together with a tract of 1500 acres of coking coal nearby. A new roughing mill was installed on the 24-inch strip mill at the Farrell Works during the year, as well as a 4-high reversing cold mill. The company is now installing a 14-inch hot mill at Farrell, and two new electric weld tube mills at the unit are now in operation.

Net profit of $9,234,982 was made last year on $118,849,560 in net sales and other income, compared with $6,722,019 net profit on $94,130,807 in net sales and other income in 1947.

Steel Output Sets New Records

AVERAGE weekly steel production in February at 1,865,982 tons of ingots and steel for castings was the highest on record. Total output for the month was 7,463,928 tons, greatest for any February in history, according to the American Iron & Steel Institute.

Operations averaged 101.2 per cent of capacity, tying the record of October, 1943.

Production by processes: Open hearth, 6,627,079 tons and 101.8 per cent of capacity; bessemer, 379,698 tons and 95.3 per cent; electric, 457,151 tons and 97.5 per cent.

Revised total output for January was 8,183,495 tons, 100.2 per cent of capacity.

Turn Out Radiant Heating Pipe

JONES & Laughlin Steel Corp. is producing buttweld steel pipe of ¾ to 1-in. diameter especially adapted for radiant heating at its Aliquippa works. First large-scale installation of the new product is being made in Ohio State University's $8 million medical center under construction at Columbus, O.

More than 65 miles of the pipe are being used in elaborate panel radiant heating systems. The pipe is made of

soft open-hearth steel of bending quality which provides for ease in fabrication for such service.

Tool Sales Picture Mixed

Increased selling efforts noted in spotty machine tool market. Price cuts unlikely

FOLLOWING January's rise in new orders for machine tools (STEEL, Feb. 28, p. 53), reports from dealers regarding business in February vary considerably. Some dealers note considerable activity with inquiries brisk as a result of the desire of manufacturers trying to cut costs by improved production efficiency. A Cleveland distributor stated that his company added another man to its sales force in order to take care of prospective purchasers.

Other dealers stated that the January upswing was due to government orders whether placed directly or indirectly by firms with government contracts. Orders by private enterprise are reported to be slow with many companies hesitant to buy expensive machine tools until the current business picture comes into clearer focus.

On the subject of prices, it is pretty well agreed that few if any price cuts on machine tools are in prospect. "Price cutting brings in no new business," one dealer stated. "Unlike consumer goods where a price decrease usually brings an upswing in buying, prospective purchasers of machine tools are more interested in long-term savings by virtue of using the new machines than they are in a small mark down."

Some price adjustments are in prospect in the near future, but a number of these are upward. A maker of milling machines is readying a price increase after holding his selling price steady for more than ten years. Also, some increases are expected in special purpose machines where costs are high due to design costs and other factors involved in making a "tailor made machine."

$750 Million in Ghost Orders

MORE than $750 million in tentative pool orders have been sent to machine tool builders for production when and if "M-Day" arrives. Heavy orders also are under discussion, but not issued, for cutting tools, gages, fractional horsepower motors, ball and roller antifriction bearings and similar items.

This picture of preparedness planning was given a conference of businessmen at the Commerce & Industry Association in New York by Edward V. Hickey, director of production, National Security Resources Board. Mr. Hickey said more than 800 industrial executives now are working with the board to solve mobilization problems.

"Red tape" in issuing actual orders, he said, has been reduced 70 per cent as compared with World War II.

Producing New Type Lock Nut

PRODUCTION of a new type lock nut in a full range of sizes, from ⅜-in. to 2-in., has been started by a newcomer to Chicago, Security Locknut Corp. The company, a division of C. G. Conn Co., Elkhart, Ind., until last fall when it was set up as an independent organization, has equipped a plant at 1815 N. Long Ave., Chicago 39, and is rapidly expanding output. Officers are W. H. Racine, president, and Emerson E. Mead, secretary-treasurer.

Locking action of the nut, which is said to be reusable and nondestructive to bolt threads, is derived from a hardened high-carbon spring steel threaded retainer permanently assembled within a standard nut. Prevented from rotating by lugs, the insert, which is slightly elliptical in shape, grips the bolt while leaving the bolt load to be borne by the nut.

Already in use by a number of railroads and mining and construction machinery makers, the lock nut is said to be particularly suited to heavy-duty applications.

Continuous Pipe Mill Tested

WHILE a few test runs of the National Tube Co.'s new continuous pipe mill at Lorain, O., were run within the past week or so, it will be some months before the mill is ready for commercial production. Benjamin F. Fairless, president, U. S. Steel Corp., of which National Tube is a subsidiary, last week was quoted as stating the mill already had started operations.

Warns of Scrap Complacency

THERE is danger present easier supply in iron and steel scrap may breed complacency and lay the groundwork for a return to a condition of shortage, Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel Inc., declared at the annual consumers' dinner of the St. Louis chapter of the institute at St Louis, Mar. 8.

The record performance in scrap in 1948, when 29 million gross tons were consumed and 1¼ million tons were added to consumers' inventories, was made possible by the fullest and most efficient operation of the scrap machinery of the country, according to Mr. Barringer.

"The scrap industry has no vested interest in price," he said, "but it is concerned that the market be not driven down to a point where the elaborate machinery that has been built up for collecting and processing scrap will be disrupted."

Lagging interest of consumers in German scrap due to the greater availability of domestic scrap will result in a decline in imports, beginning in the second quarter, Mr. Barringer predicted. He urged barriers to the movement of scrap to Canada and Mexico be lifted.

Smaller Cars Coming

Two builders launch light car programs, after Chrysler offers two lines on shorter wheelbase

IMMINENCE of new short-wheelbase models (7 inches under regular types) from Dodge and Plymouth assembly lines, likely to be sold at substantially lower prices, has stimulated activity in the small car field by at least two other auto builders, reportedly Ford and Kaiser-Frazer. Designs of the latter two, however, would not be in production before next year.

While many of the 1000 engineers attending the Society of Automotive Engineers national passenger car body and production meeting in Detroit last week speculated on the implications of these moves, a portion of the program was devoted to the trend toward shorter cars.

Trend Developing Rapidly—Austin M. Wolf, consulting engineer, emphasized that the trend to smaller and shorter cars is developing rapidly. He declared that 1948 models reached the ultimate in length and that everywhere now the move is toward shorter, lower and narrower bodies, without too serious a sacrifice of interior dimensions. An appreciable reduction in length has been possible by closing up the vacant space between radiator and grille found in most postwar models.

Steel Supply Easing—Highlight of the meeting was a banquet Thursday evening at which E. L. Shaner, chairman and treasurer, Penton Publishing Co., and editor-in-chief, STEEL, spoke on the subject, "Steel Will Come Through." His remarks were billed as "the answer to Detroit complaints" over steel supplies. Mr. Shaner was introduced by George Romney, assistant to the president, Nash-Kelvinator Corp.

Manganese Shortage

Traced to decreased supplies from India due to transport difficulties and high prices

SHORTAGES of manganese ore in this country and elsewhere can be traced more or less directly to decreased supplies from India, compared with prewar, according to Ralph R. Feuerring, vice president, Ferro Metal & Chemical Corp., 50 Broad Street, New York, who has just returned from a round-the-world trip, during which he spent two months in India investigating the manganese situation.

He said the prime reason for the decrease in Indian shipments to this country has been the difficult transportation problems, although another has been the constant increase in prices in the last six years to levels now more than double the prewar price.

He pointed out that one factor in these higher prices is the offers made by The Supreme Command of the Allied Powers (SCAP) in Japan. Thus, he explained, Japan is competing effectively with the stockpiling program of the government and industry in the United States.

"Although it is true that the freight from India to Japan is considerably less," Mr. Feuerring is quoted, "it is a somewhat abnormal condition that the American government has permitted one of its agencies, SCAP, to compete with its own stockpiling program and with American industries.

"Nothing could clear up the manganese ore supply situation faster than a categorical announcement by the American government that SCAP would not be permitted in the future to compete price-wise with its own efforts and that of American industry for the supply of manganese ore.

New Indian Licensing—"The Indian government, apparently, also aware of the situation, has recently initiated a new export licensing system whereby definite quotas have been allocated to various countries, primarily to the United States, Japan, the United Kingdom and Bizonia, all of which are regarded as hard-currencies areas for India. Under this system only holders of export licenses are given priorities for railroad cars, and since export licenses are to be given only to mine owners and traditional exporters, the Indian government hopes that the trade will be concentrated through more regular and traditional channels."

He said that the American government has recently been negotiating directly with the Indian government on a trade pact involving American steel in exchange for manganese ore.

"Up to the present, however, this agreement apparently has not met with success," he said.

Expect Exports To Hold Steady

AMERICAN exports are expected to show little change from last year, Francis McIntyre, assistant director, Office of International Trade, declared in New York. He said he would be "surprised if the United States fails to average $1 billion a month in exports this year."

Commenting on the export licensing situation in view of its recent extension under the bill signed by President Truman, he indicated that the longer period of 28 months, or until June 30, 1950, as now provided, is necessary because: (1) Licensing control is needed for security reasons rather than because goods are in short supply; and (2) the former shorter period of one year creates major administrative difficulties. About two-thirds of the licensing now has "security significance" against a division of about fifty-fifty six months ago.

Votes Continued ECA Aid

CONTINUED European aid for the next 15 months, with an expenditure of over $5½ billion, and with provision for acquisition by this country of needed strategic materials, was voted last week by the Senate Foreign Relations Committee. The committee recommended to the Senate the appropriation of the full amount requested by the President.

Present plans call for bringing the bill before the Senate as soon as the current filibuster will permit. A number of senators indicated in committee they would reserve the right to vote as they wish on the question of actual cash outlay, when the time comes. The present ECA can authorize funds only until Apr. 3, so that prompt action is indicated.

EARL L. SHANER

GEORGE O. HAYS

EARL L. SHANER was elected chairman of the board and treasurer, and George O. Hays, president, at the annual meeting of the board of directors of the Penton Publishing Co., Cleveland, publisher of STEEL, *The Foundry, Machine Design, New Equipment Digest,* technical books and directories.

In addition, Russell C. Jaenke was re-elected vice president, Frank G. Steinebach, vice president and secretary, and Edith L. Werner, assistant treasurer.

In his post as chairman and treasurer, Mr. Shaner will continue to serve as editor-in-chief of STEEL. He has served as president and treasurer since 1937, at the same time continuing his editorial activities.

Mr. Hays, who succeeds Mr. Shaner as president, has been vice president and general manager of the company with which he became associated in 1913 in an editorial capacity. Shortly thereafter he was sent to represent the company in New York as eastern manager. In 1929 he was transferred back to the main office in Cleveland to assume supervision of the business activities of the company, particularly the development of *Iron Trade Review,* predecessor of STEEL.

During recent years, as vice president and general manager, Mr. Hays has taken on additional responsibilities in the executive management of the company.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Democratic majority on Senate Labor Committee may have walked into trap by reporting out labor bill in form demanded by the President. High-handed action resented

DID THE Senate Labor Committee's Democratic majority walk into a trap, when they reported out a labor bill exactly "as is," the way the President demanded?

Despite the indignation of Sen. Robert Taft and other Republican leadership at what the senator termed "the most high-handed action I have ever seen in the Senate," there is suspicion, he may not have been as surprised as he seemed.

All week, the Senate had been stalled in a leisurely filibuster staged by southern opposition to the President's civil rights legislation. Administration leaders have fumed that the filibuster could only have lasted this long because the Republican minority has not seemed to care.

Not Without Friends—Now, with a labor bill brought out under forced draft, that would repeal the Taft-Hartley act, restore a rejuvenated Wagner act, and give the President the voluntary procedure for dealing with strikes that he has sought in place of more positive measures now in the law, the Taft opposition may not be without friends.

So runs the speculation.

However, there was genuine anger on the Republican side at having a committee door shut on some 20 amendments which Senator Taft and Sen. Wayne Morse, of Oregon, had ready between them. The amendments would have preserved major features of Senator Taft's original law. They may yet figure in the legislation.

Senator Morse is a liberal Republican; he was an opponent of the original Taft law. His and other amendments might well have picked up support on both sides of the aisle. However, he, along with another Republican liberal, Senator Aiken, Vermont, joined Senator Taft in criticism of the brusque handling of the bill in committee by the majority. Nor were all the Democratic committee members happy about it, according to after-meeting observations.

Morse Speech Awaited—The senator from Oregon is expected to give a tipoff on the liberal Republican view of the proposed legislation when he addresses the industrial relations conference of the Malleable Founders' Society in Cleveland, Mar. 11.

Subject of his address will be "Labor Legislation Must Be Fair to Employers and to Unions Alike."

The senator has been a member of the subcommittee which has had charge of scheduling witnesses before the Senate labor hearings. For a number of years he was dean of the University of Oregon Law School and served as a member of the National War Labor Board from 1942 to 1944 when he was elected to the Senate.

Termed Party-line Report

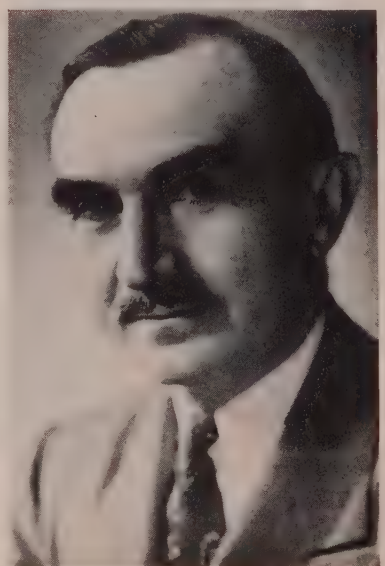
STRATEGIC situation engendered by the labor bill report may extend to the Joint Economic Committee's report, to which Senator Taft also has objected.

This report, it is true, tempered some of the recommendations, notably with reference to government steel facilities, as well as some controls sought by the President.

However, Senator Taft quickly termed it a party-line document, though in other words. It is clear that any move to translate its various suggestions into definite legislation would be met on political grounds.

And, as with the labor bill, there is enough division of sentiment to indicate that forces would be split on both sides of the aisle.

While it occasioned no comment, it was noted that the administration economists and the Senate Joint Committee, both favored more stringent credit controls than were already in effect, and that almost immediately afterward, another agency of the government eased the major credit restrictions further.



SEN. WAYNE MORSE

Would Expand Commerce Unit

HERBERT HOOVER's Commission on Government Organization has recommended that the Commerce Department, which Mr. Hoover once headed, be enlarged.

The commission urges that all government controls of transportation—on railroads, highways, planes and ships—be shifted to the Commerce Department. Under the proposed setup the department would get the following additional agencies and duties:

National Advisory Committee on Aeronautics, complete with almost 7000 workers.

The Coast Guard, now berthed in the Treasury Department.

Public Roads Administration, from Federal Works Agency.

Job of buying, selling and subsidizing ships, from the Maritime Commission. Office of Defense Transportation, from the President's office.

All truck and bus safety operation, as well as several railroad functions, including the authority to deal with the boxcar shortage, from Interstate Commerce Commission.

Duties of issuing and enforcing air safety rules, from Civil Aeronautics Board.

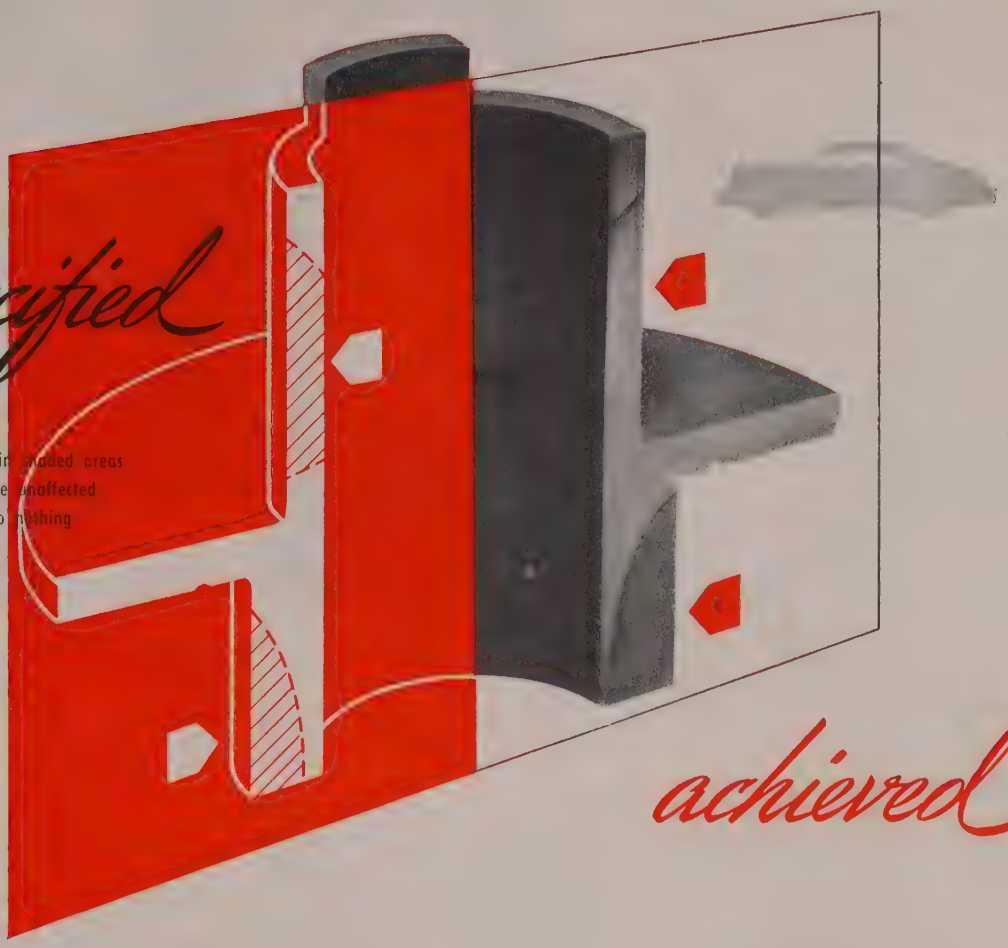
All commercial fisheries activity, now part of the fish and wildlife service in the Interior Department.

Dispersion Proceeds Slowly

INDUSTRY is slowly shifting from large to smaller cities in a trend which the National Security Resources Board is trying to hasten for the sake of defense.

Since 1940 the percentage of plants established in cities of 100,000 or less has risen from 53 per cent to 66 per cent, but industrial concentration in heavily populated, militarily vulnerable areas is still alarming, according to Dario G. Barozzi, assistant director of industrial dispersion, NSRB. The situation requires no major upheavals, he added, but it does require

another part for a torque converter transmission



specified

Hardness Rc 60 in [illegible]aded areas
other areas to be unaffected
distortion next to nothing

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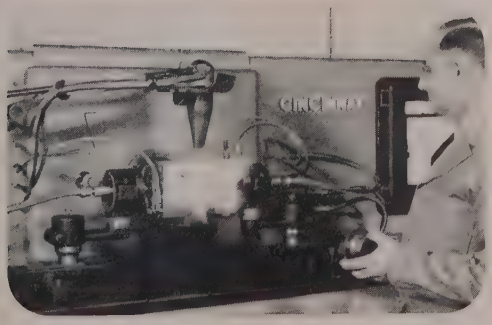
by flamatic selective surface hardening



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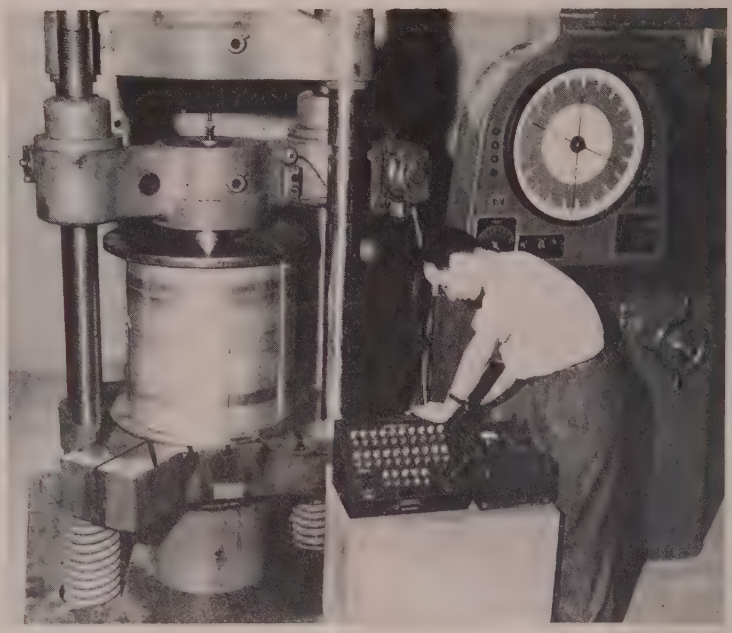
vigilance so that the dispersion trend is not slowed down.

Speaking before a meeting of the American Society of Civil Engineers, Mr. Barozzi pointed out that about 60 per cent of our population lives in urban communities which occupy less than 3 per cent of our total land area. Since 1940 United States population has jumped by 14.3 million, but our cities and their suburbs have taken about 72 per cent of this total gain.

The Census Bureau forecasts that by 1975 our population will increase by another 25 to 40 million. If the proportion continues in favor of the cities, the labor supply will become the bottleneck in halting the trend toward dispersion. Industry's relocation in cities of less than 50,000 and occupying less than 5 square miles is NSRB's goal.

Dispersion is practical, Mr. Barozzi argued. Annually industry is spending $12 billion to $14 billion on new plants and equipment. Much of this money could be spent to place new plants in smaller localities. Economic, as well as military, advantages could result from lower taxes, rents and insurance rates, fewer social problems and new markets.



STRENGTH TESTER: This new machine at the aeronautical department of New York University's college of engineering is being used on research tests sponsored by the Office of Naval Research involving construction of the "sandwich" type. Objective is the development of design formulas to apply to this type of structure, which consists of two metal faces separated by a low density plastic core

Belgium Gets Steel Plant Loan

BELGIUM has been granted a $16 million loan by the International Bank for Reconstruction & Development to finance imports of equipment for construction of two steel mills and a power plant near Liege. Two private Belgian steel corporations and a private electric company will utilize the proceeds of the loan.

Most American observers have commented on the hard work they have seen in Belgium since the war, striving for postwar recovery. The bank, in announcing the loan, makes the same observation.

Belgian recovery, the bank said, has been very rapid. Nevertheless, Belgium needs to re-equip its industries in order to lower export prices, if it is to maintain its position in world markets.

From the total of the loan, $4,500,000 has been allocated for purchase abroad of equipment for a cold-rolling mill with tin plate facilities. The bank states this will be done by a Belgian subsidiary of S. A. John Cockerill, oldest and largest steel manufacturer in Belgium. The total cost of this project is approximately $9.8 million, of which about 55 per cent will be met by the company.

Other equipment to be purchased includes a blooming mill, for a second Belgian company.

As a sidelight, an American official observer has just reported to this government that approximately 72,000 tons of dismantled machinery from 91 factories were shipped out of Bavaria on Dec. 1, 1948; of this tonnage, 43,000 went to eastern Europe, and 29,000 to western European countries.

Would License Canadian Ships

HOUSE Merchant Marine Committee has ordered favorably reported a bill to authorize vessels of Canadian registry to transport iron ore between U.S. ports on the Great Lakes from Mar. 15, 1949, to Dec. 15, 1949, inclusive.

Appointed to Electronics Post

CHARLES A. Mabey, formerly director of research, Bristol Co., has been appointed to the staff of the National Bureau of Standards, where he will supervise electronic miniaturization, circuits, and processes as assistant chief of the Engineering Electronics Laboratory. Mr. Mabey has done research on microwave and ultra-short wave radio equipment, humidity measurement, industrial instruments, and automatic control apparatus. He was research director for the Bristol Co. from 1936 to 1948, on the staff of the Mathieson Alkali Works from 1933 to 1936, and with the International Telephone & Telegraph Corp. from 1929 to 1932.

Jap Scrap Mission Returning

TWO technicians who have been surveying Japan's scrap potentialities are now enroute to the United States.

Marshall A. Shapiro and George L. Sturm, members of a four-man mission sent to Japan to study the Japanese scrap iron and steel stockpiles for the Army and Commerce Department, have completed their work. Two other members, steel experts, will leave for the United States at a later date.

Named to Advisory Committee

WALTER S. Doxsey, president, American Steel Warehouse Association, Cleveland, is among a group of wholesale trade executives who have accepted membership on a new Wholesale Trade Advisory Committee to consult with the Department of Commerce on government statistical and research projects. Others include C. G. Pyle, managing director, National Electrical Wholesalers Association, New York; and B. W. Ruark, general manager, Motor & Equipment Wholesalers Association, Chicago.

Europe Drives for Trade Balance

OEEC committee studies export-import balances of ECA nations. Imports outbalanced exports in 1948, but improvements were made, notably in Britain, Belgium and Norway

WESTERN European industry is following with interest the progress of a new economic directorate which last week was drawing up a long-range, co-ordinated recovery program for the Marshall Plan nations.

Formed a few weeks ago as an eight-man executive committee of the Organization for European Economic Co-operation, the commission has defined its major objective for 1949 as financial and monetary stabilization within each of the 19 participating areas. The committee will study export-import balances of the various countries and will draft resolutions for submission to OEEC.

Imports generally throughout Europe still outweigh exports, but the scale came closer to balance in 1948 than during any time since the war, particularly for Great Britain, Belgium and Norway.

Great Britain

PROPORTION of United Kingdom imports from the Western Hemisphere was reduced from more than 45 per cent of total imports in 1947 to 33.5 per cent in 1948. This compares with a prewar figure of 32.7 per cent. Europe, with 23.7 per cent, provided a greater share than in 1947, but a much smaller share than in 1938. Nearly 36 per cent of the total 1948 imports came from the Sterling area.

Distribution of UK exports was not fundamentally changed in 1948. Shipments to the United States did not expand equally with total exports, but the proportion going to the entire Western Hemisphere, 16.5 per cent, was slightly above 1947. Europe took 29 per cent and the Sterling area more than 47 per cent of the total exports.

Output of iron castings in Great Britian during the fourth quarter of 1948 was 828,975 tons, and the production of malleable castings was 30,980 tons. Total output for 1948 of gray and malleable castings amounted to 3,283,901 tons, 15.4 per cent above the 1947 figure.

Belgium, Luxemburg

WHILE Belgium's total balance of payments is approaching equilibrium, there is still a considerable deficit with the Western Hemisphere.

Iron and steel is the chief reason for the relatively good showing. The Belgium-Luxemburg union exported 3,523,135 tons of ferrous products in 1948, compared with 2,286,195 tons in 1947, making the union the largest steel exporter in Europe. Nearly 50 per cent of these exports, however, are made under bilateral commercial agreements, and in exchange Belux must take goods that are not always essential to these countries. Belux's 1948 steel exports amounted to 55 per cent of its total production; 50 per cent of total output was exported in 1947.

The outlook for the future is spotty. Argentina, Belgium's second best customer in 1948, has suspended all Belgian imports for the time being. French business is declining and Sweden this year will take only half the Belgian steel it imported in 1948. Trade with Western Germany, Britain and India continues very active.

Norway

NORWAY's total payments deficit for 1948 amounted to $152 million, compared with $199 million in 1947. The improvement resulted from increased shipping revenues and from more exports. The dollar deficit, $52.2 million, was also smaller in 1948 than it was in 1947, when it was about $102 million.

Still more improvement, if not balance, is expected for 1949, one reason being that some of the ECA-engendered industrial construction will begin operating during the year. One of these construction programs is at the Ardal iron and steel works which will begin deliveries of semifinished steel by the end of the year. Another extension is at the Sandviken ironworks, to be completed by 1955. Its capacity will be increased 40 per cent.

Western Germany

GERMAN industry, in the face of Allied restrictions, is shelving the more ambitious aspects of its program for a world export drive.

Ruhr industrialists chafe at these export lids, particularly because production generally continues to rise and is now at about 78 per cent of industrial output in 1936. Steel ingot and casting production totaled 651,421 tons in January, 6.4 per cent more than in December, 1948. Pig iron output, at 547,370 tons, was 6 per cent over the December record. Production of rolled products, however, fell to only 437,394 tons, slightly below the December record. Sheet production is 200 per cent above January, 1948, but plate demand has fallen off.

Minor wage adjustments are expected in Germany during the year, but the overall situation is reasonably quiet, chiefly because prices are falling, but wage rates haven't.

The slow process of reorganizing the steel industry took another step forward last week with announcement of the American members of the Tripartite Steel Commission which will be a technical staff to furnish professional guidance for the industry on operational and steelmaking practices, product distribution and many other matters. William J. Brinkerhoff, manager, Direct Sales Division, United States Steel Export Co., was named to head the commission.

As members of his technical staff, he will have Frederick M. Gillies, Inland Steel Co., as deputy; Ian F. L. Elliot, U. S. Steel Export Co., as liaison consultant; Werner P. Nauman, U. S. Steel Export Co., as economist; and Harry Saxer and Harry Stark, both of Jones & Laughlin Steel Corp., as production advisers.

France

FRANCE expects to export 1.2 million tons of semifinished products and 200,000 tons of pig iron in 1949. Exports of ore in 1948 totaled 6,311,000 tons, against 6,429,000 tons in 1947. End-product exports should improve during 1949, particularly shipments of automobiles. All auto makers are now shipping overseas at least half their output.

The nationalized Renault works produced 68,275 vehicles in 1948, the total including 22,628 4-hp cars and 35,738 trucks. The firm also turned out 5202 tractors. The French Ford company produced 15,000 units during the year. Its new model, the Vedette, is now in production and should be coming off assembly lines at the rate of 100 per day by the end of the year.

A project for the nationalization of the French iron and steel industry, tabled once before by the National Assembly, has been re-examined and again shelved.

How Times Have Changed

WHAT'S happened to the foreign market for American cars? No longer than a year ago, returning Americans burned the air with fabu-

lous stories of how they could buy almost any make of new-model American automobile, across the border, while there were none to be had at home.

Hundreds of automobiles fill the warehouses of Tijuana and Ensenada, Mexico, say official dispatches to Washington, with no buyers. The reason, it is stated, is the devalued peso, and the fact that new model American cars are priced on the Mexican markets at $200 to $400 above the price at which comparable models are now, in many cases, available immediately in San Diego, Calif., and Los Angeles.

Immediate Delivery—Some dealers in the Mexican towns mentioned, it is said, are now offering immediate delivery, any model car, for nothing down and up to two years to pay.

In Belgium, another market where in other times the American could see the cars from home he couldn't buy at home, the end of 1948 saw saturation of the demand for French, British, and higher-priced American cars.

As in Mexico, according to official observers' reports, ready availability of new models has cut the used car prices, and prospects for 1949 imports are placed at about 20,000 cars.

As a side-note, the famous, if not often seen Volkswagen, which was to be the German people's reward for belief in Hitler, is actually being turned out in sizable numbers, under American and British auspices. The production of the "people's car" set a new postwar record in November, with 2403 passenger cars.

Operations Get Started

At pilot plant for pelletizing ore concentrates erected by Reserve Mining Co.

OPERATIONS are expected to begin this week at the new pilot plant for pelletizing iron ore concentrates which was erected during the last year by Reserve Mining Co. at Ashland, Ky. Reserve is managed by Oglebay-Norton & Co., Cleveland. (See STEEL, Aug. 30, 1948.)

Employing 200 men, this four-story plant was erected at a cost of approximately $1 million.

Using ore concentrates of around 67 per cent iron content secured from Jones & Laughlin's New York state Benson mine, the plant expects to produce during its first year of operation, 60,000 tons of pellets to be used in tests at the blast furnaces of Armco Steel Corp., part owner of Reserve Mining Co.

Experiments will be run on optimum pellet size and various binders used in the process. When all tests have been completed and if found successful, a full-scale taconite concentrating and pelletizing plant will be erected at a cost of $100 million at Beaver Bay on Lake Superior.

Hanna Finds More Canadian Ore

EXPLORATION and drilling by M. A. Hanna Co., Cleveland, reveal the existence of about 300 million tons of very good grade, direct shipping, open pit iron ore and manganiferous iron ore at its Labrador and Quebec concessions.

About one-third has been found in the Labrador tract, comprising 18,000 square miles, and two-thirds in Quebec area which covers about 3800 square miles. There is much more territory in Labrador than in Quebec which is entirely unexplored. Hanna estimates that the development of these areas may involve the expenditure of as much as $200 million for mining and railroad equipment, power development, railroad and dock construction and townsites for the many people involved. Additional exploratory work will be continued, and as the properties develop, plans for the future will be made.

The company's 1948 operations included shipments of 11,828,000 tons of iron ore, shipments of 11,234,000 tons of lake coal and production of 2,691,000 tons of anthracite coal. Its fleet of 13 vessels operated at capacity throughout the Great Lakes shipping season. Hanna's 1948 net profit was $9,087,574, compared with $7,282,506 in 1947 and $5,611,654 in 1946.

Plan Lake Shipping Opening

LOOKING toward the earliest possible opening of shipping on the Great Lakes, John T. Hutchinson, president, Lake Carriers' Association, convened a meeting of a special committee to consider with Coast Guard officers problems incident to beginning a new shipping season.

The mild winter may permit the first ore carrier to lock through at Sault Ste. Marie in advance of the 1948 date. The first upbound carrier went through on Apr. 4 last year, and the first carrier downbound loaded with ore went through on Apr. 7.

The iron ore stockpile may measure about 18 million tons as of Apr. 1, two million tons better than at the same time last year due to a record peacetime movement of 82,937,291 in 1948.

Members of the "Ice" Committee, in addition to Mr. Hutchinson, are presidents of four of the principal fleets: Elton Hoyt II, Interlake Steamship Co.; W. C. Hemingway, Pittsburgh Steamship Co.; A. T. Wood, Wilson Transit Co.; and J. Burton Ayers, Great Lakes Steamship Co.

Lake Carriers To Meet Mar. 31

ANNUAL meeting of the Lake Carriers' Association, Cleveland, will be held Mar. 31. At all-day sessions

MORE POWER: Worker with portable grinder smooths the vanes of a cast steel Francis type water wheel runner for the first of four additional 35,000-horsepower, 92-foot head hydraulic turbines being built by Allis-Chalmers Mfg. Co. for Wilson Dam power house. Runner will have a finished weight of 95,000 pounds

committee reports will be heard and consideration given to programs and projects for 1949. The board members represent 26 lake fleets.

Iron Ore Probe Proposed

SENATE investigation of the iron ore industry is proposed by Sen. Alexander Wiley (Rep., Wis.), aimed at showing the necessity for the St. Lawrence waterway as a national defense measure.

The probe, it was said, is advocated by Midwest industrialists who maintain Labrador iron ore must be fed to the midwestern steel mills to replace dwindling reserves of high grade iron ore at the head of the Great Lakes.

M. A. Hanna Co., Cleveland, plans to develop high-grade ore reserves acquired in Labrador, and is supporting proposed construction of the St. Lawrence seaway as a means for getting the Canadian ore to the American market.

Proponents of the seaway see little chance of the project being acted upon during the present session of Congress.

Belt Conveyor Opposed

Plan to build 130-mile belt from Lake Erie to Ohio river runs into railroad opposition

HOT battle appears shaping up in the Ohio legislature over proposal to build a 130-mile conveyor belt system connecting Lorain, O., on Lake Erie, and East Liverpool, O., on the Ohio river (STEEL, p. 60, Feb. 14).

Opponents of the proposed $210 million "rubber railroad," which is proposed to transport ore from the lake and coal from the Ohio river area, will present their arguments when the Ohio Senate Judiciary Committee holds a second hearing on the project Mar. 15 at Columbus.

H. B. Stewart Jr., president of the Riverlake Belt Conveyor Lines Inc., which proposes to construct the conveyor, has asked the state legislature to give the belt line public utility status to enable it to acquire right-of-way through exercise of eminent domain.

Opposed By Railroads—Various railroads operating in Ohio are opposed to the plan, as are the railroad brotherhoods. A 12-member railroad committee, headed by Rufus Flinn of the Pennsylvania, has been formed to fight the project.

Mr. Stewart presented his arguments to the Judiciary Committee on Mar. 1 describing how the belt would operate in both directions. Kenneth Lloyd, executive secretary of the Mahoning Valley Industrial Council, testified that steel plants in the Youngstown district are in favor of the project. He said Youngstown's steel industry has been melting away and expressed the view that the belt line would restore it.

The proposed belt, which will be privately financed, will require 243,000 feet of 72-in., 887,000 feet of 60-in., and 281,000 feet of 42-in. belt; 400,000 idlers to support the belt; 217 terminal power units; 151,000 tons of structural steel and a considerable tonnage of corrugated sheets.

The elevated structure will have minimum clearance of 22 feet, and the belt will be fully enclosed in a weatherproof steel tube.

Big Savings Seen — Mr. Stewart says that minimum cargo volume required by the lines will be 30 million tons a year, possibly 15 million each of ore and coal, but a total maximum capacity will be 52 million. Cost of the line, it is claimed, can be paid off in 20 years and at the same time permit rates low enough to save from 50 cents to $1 a ton on transportation of coal and from 47 to 68 cents a ton on iron ore to the Youngstown and Pittsburgh steel mills.

Rail Steel Bar Group Makes Film

RAIL Steel Bar Association, Chicago, has produced a color movie showing the origin, production and application of rail steel.

Entitled "Rail Steel in the World of Today," the film is designed to familiarize customers, architects, and design engineers with the product, and it also is an educational film for use by technical schools and colleges. The movie is available to these groups without charge.

Its recent showing over station WPTZ in Philadelphia marks one of the first uses of the television medium by the steel industry.

Association's annual meeting will be held May 5-6, at the Edgewater Beach Hotel, Chicago.

GM Planning Detroit Exhibit

PLEASED by the success of the "Transportation Unlimited" show which drew 300,000 to the Waldorf-Astoria in New York last month, General Motors is planning to set up the entire exhibit at Convention Hall in Detroit, Apr. 9-15, along with many new displays which could not be accommodated at New York. Aim is to provide an opportunity for the 145,000 GM employees in Michigan to inspect the current line of corporation products and the mechanical exhibits portraying advanced research, styling and engineering.

Electroplaters Name Committee

PUBLIC relations program for the electroplating industry is being considered by the American Electroplaters' Society.

Members of a committee to study the matter are: Chairman, W. M. Phillips, General Motors Corp.; C. F. Nixon, Fisher Body-Ternstedt Division of GM; D. X. Clarin, Oakite Products Inc.; L. M. Hague, Hanson-Van Winkle-Munning Co.; R. M. Shock, National Association of Metal Finishers; and A. R. Putnam, AES.

Calendar of Meetings

Mar. 14-17, Chicago Technical Societies Council: Seventh Chicago production show. Show manager is Edward C. Bowman, 8 S. Michigan Ave., Chicago.

Mar. 17-18, American Management Association: Meeting to discuss competitive marketing methods in buyer's market, Hotel Statler, New York. Association headquarters are at 330 W. 42nd St., New York.

Mar. 21-24, Forced Warm Air Conference: Eighteenth annual gathering, on Michigan State College campus, East Lansing, Mich.

Mar. 22-23, Export Managers Club of New York Inc.: Meeting, Hotel Statler, New York. Club headquarters are at 2 Lafayette St., New York.

Mar. 24-26, Electrical Maintenance Engineers Association of Southern California: Third annual industrial electrical show, Shrine Convention Hall, Los Angeles.

Mar. 28-Apr. 1, American Chemical Society: 115th national meeting, on sour crude oil, San Francisco.

Mar. 30-Apr. 1, American Iron & Steel Institute: Meeting of chairmen and presidents of company members, The Greenbrier, White Sulphur Springs, W. Va.

Mar. 30-Apr. 1, Institute of Metals: Annual general meeting at Institution of Mechanical Engineers, London.

Apr. 4-6, National Sanitary Supply Association: First institute of sanitation and modern cleaning methods, Hotel Sherman, Chicago. Press headquarters for the association are at 220 S. State St., Chicago.

Apr. 5-6, Metal Powder Association: Fifth annual meeting and exhibit, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

Apr. 6, Detroit Chapter of American Foundrymen's Society: Congress of foundry experience, Rackham Memorial Bldg., Detroit. Jess Toth, Harry W. Dietert Co., is committee chairman for event.

Apr. 11-12, American Zinc Institute: 31st annual meeting, Hotel Statler, St. Louis. Institute's Galvanizers Committee will meet concurrently with the general convention. Institute headquarters are at 60 E. 42nd St., New York.

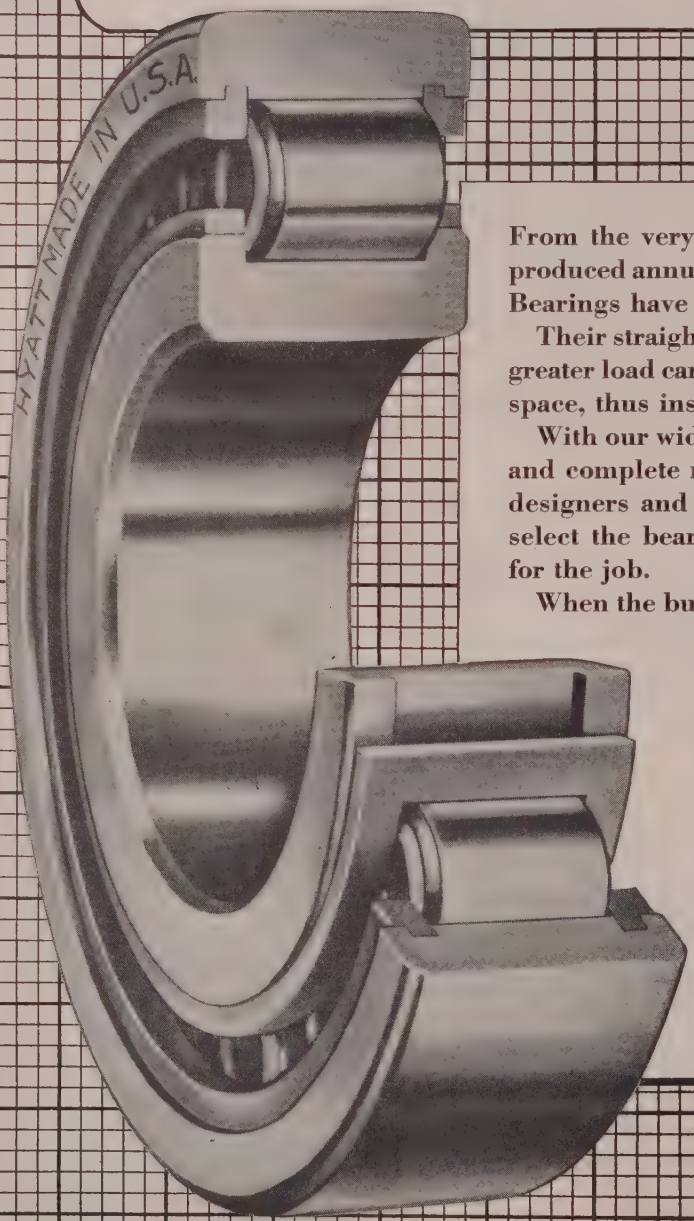
Apr. 11-12, American Institute of Electrical Engineers: Conference on industrial application of electron tubes, Hotel Statler, Buffalo. Institute headquarters are at 33 W. 39th St., New York.

Apr. 11-12, American Machine Tool Distributors Association: Meeting, Hotel Oglethorpe, Savannah, Ga.

Apr. 11-13, American Society of Lubrication Engineers: Annual convention, Hotel Statler, New York. Lubrication show will run concurrently with the convention.

Apr. 11-15, Magnesium Association: Annual meeting, Edgewater Beach Hotel, Chicago.

BUILT FIRST —TO LAST



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HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

With buyers becoming increasingly choosy, auto builders are getting down to two-fisted selling as back orders rapidly turn into nothing more than prospect lists

DETROIT

HUMAN nature being what it is, when buyers discover consumer goods pipelines filled they at once begin to get choosy and often defer plans for purchases in the hope of saving money. Since last fall this situation gradually has been becoming clear in the automobile business, with the result today manufacturers have come to the conclusion they had best forget about bulging lists of what were once thought to be bonafide orders and get down to some two-fisted selling. Back orders have become nothing more than prospect lists and not very good ones at that.

There is no great difficulty in selling cars if some intelligent effort is put behind the job. Cases are cited of two dealers selling the same make in the same city, where one has requested the factory to take back allocated cars and the other asking the plant to reconsign these extra cars to him. The difference is that one dealer will have several capable salesmen at work while the other is simply telephoning the lists of people and inquiring, "You do not want to buy an automobile, do you?"

The result is that sales departments at both the factory and dealer levels are being rapidly overhauled and the merchandising steam will be turned on full-tilt over the next few months. Easing of credit restrictions has made it possible to knock down monthly payments by from $5 to $10, this, coupled with a more generous policy on allowances for trade-ins and the advent of spring weather, are calculated to snap sales out of winter doldrums. At any rate, that is the thinking at the moment, although a careful eye is being kept on the overall picture, and plants are scanning their 10-day sales reports closely. If spring should not open up the market as expected, further adjustments in production rates are inevitable.

New Model Activity Slows

NEW model activity has slowed to a walk, now that all the '49 stuff is in production. Kaiser-Frazer started two of its special jobs down the line last week, several days ahead of schedule. Packard will be coming along with its Golden Anniversary models later in the year. A fair-sized die program is being wrapped up for Fisher Body and Ternstedt Divisions of General Motors in connection with the steel-top convertibles or "executives' hot rods" which will give the spring market a shot in the arm. First will be the Buick Riviera, followed by the Cadillac coupe De Ville, the Oldsmobile Holiday coupe, the Pontiac Catalina and the Chevrolet Bel Air. All will carry a pretty stiff price tag.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,100	422,236
February	445,635*	399,471
March		519,154
April		462,323
May		359,996
June		454,401
July		489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Feb. 19	114,207	110,536
Feb. 26	118,815	120,130
March 5	117,764	108,343
March 12	120,000	114,689

Ward's Automotive Reports

Fisher Retooling Awaited

THE TOOL and die trade is looking for a major program to break from Fisher Body shortly, in connection with retooling of the intermediate or "B" series body which will go on 1950 Buick, Olds and Pontiac, possibly as early as this fall. Originally Buick announced it would have the body ready for introduction this spring, an unlikely prospect now. Also early on the Fisher Body agenda will be complete retooling of the "C" series body which first appeared on Olds and Cadillac early in 1948. From advance reports it is understood changes will center around providing more headroom and legroom, since even this largest of the three GM body series has come in for criticism on this score.

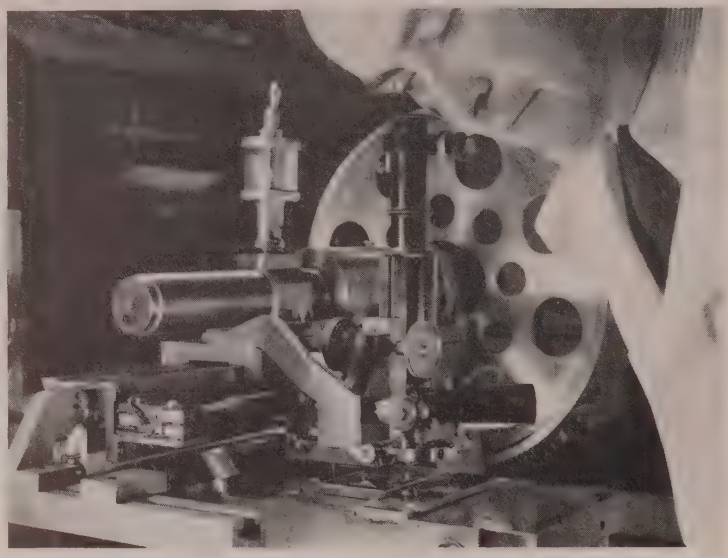
Local tool shops have heard little from Ford lately, doubtless because the emphasis there has been primarily on stepping up production. Furthermore, experimental tooling can be handled readily in the large tool and die shop at the Rouge plant where it can be kept away from the inquisitive eyes of outsiders. At the time of Ford's New York show last June, there were indications an additional series of models, of the so-called streamlined or "fast" back type, was in the works.

Chrysler Division's Turn

PUBLIC announcement of the 1949 Chrysler Corp. models has been stretched out over four weeks and this week it is the Chrysler Division's turn. Known as Silver Anniversary models, they include six lines of cars in both sixes and eights. New is a station wagon which seats nine and has removable intermediate and rear seats. Wheelbase is extended 4 inches, while overall length has been shortened by reducing the overhang in both front and rear doors. Interior width and headroom are greater, road height and width are less. Undercoating is standard on body and fenders.

Compression ratio on 6-cylinder engines has been boosted from 6.7 to 7.0 to 1, and on the eights to 7.25 to 1. (Incidentally, around Detroit the word is that oil companies are going to have high-octane fuel for truly high-compression engines on the market next year. This has caused a renewed flurry among engine designers, pointing to the early development of more high-compression power plants like those of Cadillac and Olds. Some of the more pessimistic oil people had let it be known they might require five years to bring out the new premium fuel; now it looks like a considerably shorter wait.)

Most of the other mechanical changes being announced by Chrysler



MEASURING ROUGHNESS: In an effort to establish reproducible surface finish standards, General Motors Corp. research laboratories have developed a machine that can rule up to 10,000 lines per inch in gold master blocks. Replicas of the master blocks would be used by inspectors to determine the surface roughness of highly finished mechanical parts

are common to the three other makes built by the corporation, and have been reviewed here in past weeks. One innovation is a wheel cover comprising a stainless steel cap and a white-painted ring crimped together as an integral unit and replacing the former plated steel hub cap. Another is a leather-covered safety cushion of sponge rubber ¾-inch deep extending across the concave instrument panel from the right of the instrument cluster housing to the right-hand door. It is designed to afford protection to front-seat passenger in the event of a sudden stop.

To provide more useful space and prevent the jack from jolting around the luggage compartment, a different method of bumper jack stowage has been devised. Base of the jack is placed against a metal floor stop between the tire well and fender, and the upper end is placed in a notch in the tire bracket.

Crimp in Chrysler Schedules

A CRIMP was put in Chrysler Corp. schedules last week by interruption to frame supplies from Midland Steel Products Co. where a labor dispute forced the plant to close, in turn necessitating layoff of 23,000 at Dodge, DeSoto and Chrysler Divisions. Quick settlement will likely confine the stoppage of assemblies to about three days. An increasing number of "quickie" walkouts has been breaking out around Detroit, bringing with them brief interruptions to production. They spring mainly from the changeover to new models and the retiming of new jobs. In the constant search for means of cost-cutting, managements are finding better and faster ways of handling fabrication and assembly, resulting in the institution of higher output rates and usually followed by complaints from UAW-CIO crews.

Packard Assembly Pace Cut

DURING the past two weeks there has been a temporary change in scheduling at Packard, necessitating no layoffs but reducing the assembly pace 20 per cent. One difficulty faced by Packard and not common to other producers is the lack of a suitable driveaway building or area where completed automobiles can be marshalled before moving them to the field. As models come from the assembly line they must be moved immediately to distributors, with no "float" to accommodate a possible backing-up in driveaways.

Oldsmobile Schedule Upped

ASSEMBLY schedules at Oldsmobile this month call for a new high total since prewar, with 500 more of the 88 model added to projections. This model, along with the 98, carries the high-compression V-8 engine, and the two now are accounting for 76.8 per cent of all production. Aggregate 1949 model output since last November has crossed 56,500, and Olds executives, for the record at least, can see nothing but "vigorous demand" throughout this year.

GM Employment in 1948 Tops

GENERAL Motors employment reached a peacetime record at a level of 380,329 last year and payrolls exceeded $1,283,000,000, topped only in two peak war production years when employment was about 20 per cent above 1948. Average weekly earnings of hourly-rated employees were $64.10 compared with $57.86 in 1947. The average work week was 38.9 hours, compared with 38.3 the year previous, and would have been at least 40 hours weekly except for absenteeism, a rather surprising commentary.

Continental Holds Pace

SKYROCKET rise of operations at Continental Motors Corp., which began with the war years, kept pace during 1948. Back in 1940, Continental was building engines at a rate of about 3 million horsepower a year. Four years later, under the impact of the aircraft and tank programs, this figure zoomed to 19.5 million horsepower. It fell back in 1946 to 10 million, increased in 1947 to better than 14 million and last year eclipsed 15.2 million.

Continental, and its 83 per cent owned subsidiary, Wisconsin Motor Co., build air-cooled and liquid cooled engines in the range from 1½ to 1040 horsepower, the latter a new 12-cylinder air-cooled design for the Ordnance Department. Sales in value have climbed from about $11 million in 1940 to $108 million last year, and in 1944 exceeded $250 million. Output last year breaks down to 32 per cent for farm implements and other agricultural uses, 21 per cent for trucks, busses and automobiles, 20 per cent for industrial applications, 20 per cent service parts and machine products, and the balance aircraft and marine installations. Planned for this year is the manufacture of diesel engines on a volume basis.

Rouge Resumes Glass Production

PLATE glass production at the Ford Rouge plant resumed recently with the lighting of a completely rebuilt glass furnace of substantially higher capacity. Two weeks are required for the furnace to reach heat and for the first glass to be poured. About 350 idled employees will be back on the job by the end of the month. The company produces "sheet" glass at its St. Paul assembly plant.

FERRO-SILICON

Tepco Ferro-Silicon, produced in our electric furnace plant at Chattanooga (formerly Southern Ferro-Alloys Company, Chattanooga, Tennessee), possesses to a high degree those qualities sought by steel men in this special alloy. Tepco facilities for supplying this product to the steel industry in any specified grades and sizes eliminate any chance of delay or bottle-neck.

We are prepared to meet your requirements in 50%, 65% and 75% standard and low impurity grades. Tepco Ferro-Silicon is shipped in all sizes from lump through 150 mesh by down, packaged or in bulk. Also available in briquettes, the 2½-pound briquettes containing one pound of silicon and 5-pound briquettes containing two pounds of silicon. Special grades and sizes quoted on request.

PIG IRON

Tepco's high-grade pig iron includes two preferred types:

Diamond D Pig Iron—low-phosphorous, low-silicon, high-carbon, machine cast—produced at our Wrigley Charcoal Plant at Wrigley, Tennessee.

Rockwood Pig Iron—malleable and foundry, machine cast, produced at our Rockwood, Tennessee, plant.

FOUNDRY COKE

Chattanooga By-Product Foundry Coke—produced from properly blended coals to furnish high-grade foundry coke. Widely used by foundries in the Southern area. Chattanooga coke also available in smaller sizes.

We will be glad to discuss with you, at any time, the numerous advantages of our plants and products.

TENNESSEE PRODUCTS & CHEMICAL CORPORATION

GENERAL OFFICES: NASHVILLE, TENNESSEE

PLANTS AT CHATTANOOGA, ROCKWOOD AND WRIGLEY, TENN.

Represented by

MILLER & CO., Chicago, St. Louis, Cincinnati; S. H. BELL CO., Pittsburgh; T. H. BENNERS & CO., Birmingham

ORE & FERRO CORPORATION, 30 Broad St., New York, Export Agents

Laclede Output Record

Set in 1948 with more steel produced and shipped than in any previous year

LACLEDE Steel Co., St. Louis, produced and shipped more steel in 1948 than in any previous year. Sales for the 12 months totaled $34,072,411, compared with $26,283,120 for 1947.

A $1,327,100 expansion program contributed to the output record. The building program at the Alton, Ill., works, started in 1945, progressed in 1948 and will be virtually complete by the end of this year. Developments to improve the handling of material in the open hearth department will be finished this year and will result in increased ingot production from the existing furnaces.

The thin wall tubing department, enlarged in 1947, is now an integrated unit and includes a continuous strip pickler, four electric tube welding machines and one gas welding unit. An additional electric tube welding machine will be delivered this spring. To improve Southwest distribution and to take advantage of river freight rates, Southern States Steel Corp., a wholly-owned subsidiary, has purchased land for a warehouse and fabricating plant in Beaumont, Tex. This plant will be completed this spring and will supplement the subsidiary's Dallas, Tex., operations.

Laclede produces semifinished steel, hot-rolled strip, tubular products, tubing, bar mill items, construction products, steel joists and wire products. The company earned $1,767,863 in 1948.

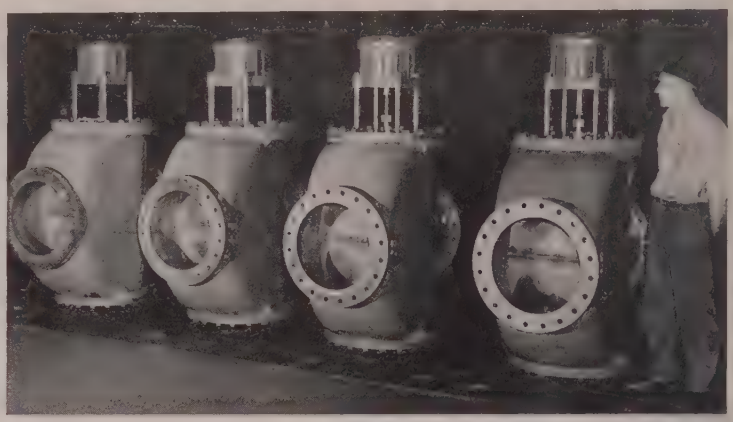
Crucible Expansion Progresses

CRUCIBLE Steel Co. of America has invested $39.1 million in plant improvements and equipment since 1946, including $20.1 million in 1948, it is disclosed in the company's annual report.

An additional $7.2 million more has been authorized, principally to complete by early summer the new hot and cold-rolled steel strip plant in the Midland, Pa., Works. This $18 million development will permit Crucible to produce hot and cold-rolled strip by a continuous process from alloy, stainless and high-carbon steels. A small part of the hot-rolling equipment went into production in 1948.

Other major 1948 projects include: Consolidation of three plants into one enlarged unit, the Sanderson-Halcomb Works, in Syracuse, N. Y., to produce tool and special alloy steels as well as many other products; organization of the Spaulding Works in Harrison, N. J., which now incorporates operations of the Cold Rolling Division and the Special Products Division; completion of a plant improvement program in the Park Works at Pittsburgh; transfer of La-Belle agricultural steel operations from Pittsburgh to the Midland Works; installation of an electric furnace at Midland and start on installation of another.

Net income of the company and wholly-owned subsidiaries was $3,596,000 in 1948 on net sales of $131 million, compared with income of $2,065,000 on sales of about $110 million in 1947.



GIANTS: Four 20-in. valves, each about 7 feet high and weighing 7000 pounds were built by Kieley & Mueller Inc., North Bergen, N. J., to automatically handle gas for a large metal processing plant. They are operated by air cylinders

Scrap Firm Marks 50th Year

SCHIAVONE-Bonomo Corp.'s 50-year, rags-to-riches story typifies the history of the entire scrap industry whose product has been transmitted by a half-century's alchemy from mere junk to a basic raw material.

Michael Schiavone founded the business in 1899 with a little junk shop on West 18th street in New York. His brother, Louis, went to work for him in 1903 and two years later bought the enterprise. Later, larger quarters were obtained on West 54th street. By 1919 the first yard was established in Jersey City, N. J. Today the company maintains its principal office and yards in Jersey City and has other yards in Harrison and Newark, N. J., the Bronx and Brooklyn, N. Y., and Stamford, Conn.

For many years president of the firm, Louis Schiavone is now stepping up to the new post of chairman. Succeeding him is Richard V. Bonomo, former secretary-treasurer who joined the company in 1912. Herman D. Moskowitz is vice president.

Mesta Finds Demand Holding

DEMAND for equipment used by the steel industry in the United States continues unabated, according to Mesta Machine Co., Pittsburgh. While business from foreign sources is off somewhat and buyers generally are more cautious, there has been "no slump at all" in domestic business, Mesta says.

Although the company went into 1949 with $35 million in unfilled orders, compared with $46 million in 1948 and $37 million in 1947, the company views its present position as "favorable." Lorenz Iversen, president, says that "letters of intent have been received from foreign countries which, when becoming actual contracts, would bring the backlog up to the 1947 level."

Mesta last year earned $5,025,281, compared with $3,028,547 in 1947.

Norge Streamlines Production

PROGRAM for streamlining production facilities and expanding merchandising in order to meet changing market conditions has been announced by Norge-Heat Division, Borg-Warner Corp., Detroit. It has been decided to consolidate manufacturing of all types of warm air heating products in plants at Kalamazoo, Mich., and Elwood City, Pa., and in the process the division's Hammond, Ind., plant will be closed.

Consolidation is expected to result in expediting service to customers and also to offset rising costs of matrials and overhead.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Multi-Hydromatic Welding & Mfg. Co., Detroit, is subjecting a large automatic multiple-transformer spot welding machine to tryouts prior to shipment to Lustron Corp., Columbus, O., manufacturer of prefabricated houses. The unit, to cost more than $100,000, is equipped with 68 welding guns which assemble 22 steel components of roof trusses for the Lustron houses.

—o—

Bureau of Mines reports reserves of easily-handled graphite ore in Alabama are sufficient to meet the demand for specialized graphite products for many years.

—o—

Albion Malleable Iron Co., Albion, Mich., has purchased a steel casting facility in Albion from War Assets Administration for $350,000. The property was leased during and since the war by Albion which now plans spending about $450,000 more for new equipment.

—o—

Osborn Mfg. Co., Cleveland, is now marketing two new molding machines for foundries and a new work piece holder.

—o—

Manufacturers' Agents National Association has prepared a "Standard Form of Agreement with Manufacturers' Agent," designed to be fair to agent and principal alike and containing mutually protective provisions. A copy is available from the association's executive secretary, 542 S. Broadway, Los Angeles.

—o—

National Research Council, Washington, has formed a Building Research Advisory Board to provide more and better building construction, including housing.

—o—

Elastic Stop Nut Corp. of America, Union, N. J., has acquired all patents and other rights to make and sell the Roll-Pin from Mid-Continent Metal Products Co., Chicago. The item is a vibration-proof fastener.

—o—

International Harvester Co., Chicago, has formed a wholly owned subsidiary, International Harvester Credit Corp., to assist in financing the parent organization's time sales.

—o—

Farms Tools Inc., in which Walter E. Schott and other Cincinnatians hold a controlling interest, has bought Harvey Mfg. Co. Inc., Racine, Wis., manufacturer of hammer mills, grain elevators and corn shellers. Farm Tools operates plants in Mansfield, O., and Evansville, Ind.

—o—

Aluminum Co. of America, Pittsburgh, has appointed Central Steel & Wire Co., Chicago, as distributor of aluminum fasteners in the Midwest.

—o—

Hickok Mfg. Co., Rochester, N. Y., maker of men's jewelry, buckles and related items, marked its 40th anniversary last week with a tour of its four newly consolidated and reorganized plants in Rochester, Mount Morris and Lyons, N. Y. Operations during World War II were scattered in 19 small plants and warehouses.

LONG TRIP HOME

WHEN two 92-ton copper cyclotron coils reach Carnegie Institute of Technology's Nuclear Research Laboratory at Saxonburg, near Pittsburgh, their arrival will climax a seven months' struggle to get the parts from the Brooklyn Navy Yard where they were built.

Twenty feet in diameter, the magnet coils were too wide for railroads, and Pennsylvania highway officials refused to permit them on state roads. They were finally shipped by seatrain from New York to New Orleans then by barge from New Orleans to Kittanning, Pa., where last week they were stalled, pending clearance of a 33-mile truck route to Saxonburg.

Whiting Corp., Harvey, Ill., manufacturer of cupola furnaces, overhead cranes and special handling and maintenance equipment, recently honored 40 employees and retired workers who have served the company 25 years.

—o—

American Cladmetals Co., Carnegie, Pa., has appointed Steel Sales Corp., Chicago, as sales agent for Rosslyn metal in the midwestern states.

—o—

Mathieson Chemical Corp., New York, has acquired Standard Wholesale Phosphate & Acid Works Inc., Baltimore, through stock transfer. Standard produces sulfuric acid, superphosphates and mixed fertilizers.

—o—

Diamond Chain Co. Inc., Indianapolis, maker of chains, sprockets and related products, has named Apex Power Equipment Co., Chicago; Ray M. Ring Co., Chicago; W. F. McGraw & Co., Detroit; and Chase, Parker & Co. Inc., Boston, as distributors in their respective city areas.

—o—

Ferro Enamel Corp., Cleveland, manufacturer of finishing materials, has graduated 22 from the 1949 session of its training course on all phases of process control in the porcelain enameling operation.

—o—

Pioneer-Toledo Corp., Toledo, O., manufacturer of paper drillers and saws and routers for the duplicating and printing industries, has appointed Addressograph - Multigraph Corp., Cleveland, as distributor of a new paper driller in the United States and Canada.

—o—

Adalet Mfg. Co., Cleveland, maker of bushings and fittings, has named L. Philip Ertel Co., Philadelphia, as factory representative for the Middle Atlantic states.

—o—

Farrel-Birmingham Co. Inc., Ansonia, Conn., has appointed M. H. Blank, Detroit, to handle the sale of gears and gear units manufactured at the company's Buffalo plant.

—o—

Illinois Tool Works, Chicago, has appointed Tools Inc., Philadelphia, as sales representative in that city for its hobs, broaches and cutters.

—o—

Allis-Chalmers Mfg. Co., Milwaukee, has purchased a warehouse at Carrollville, Wis., from War Assets Administration for a price in excess of $300,000. The property, comprising 68.7 acres of land, will be used temporarily for warehouse purposes and later will be converted to general manufacturing.

—o—

Instrument Corp., manufacturer of meteorological instruments, has moved to larger quarters in the former plant of Julien P. Friez & Sons, 4 N. Central Ave., Baltimore.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, reports that factory sales of standard-size household vacuum cleaners in January totaled 228,811 units, 16.5 per cent below December and 24.7 per cent under January, 1948.

The Business Trend

LEVEL of industrial activity remained steady for the fourth consecutive weeks as STEEL's industrial production index held at 171 per cent of the 1936-1939 average. The index for the latest week is several points below the peak reached during record operations last October but is 5 points higher than in the corresponding week of 1948.

STEEL — Although output of steel for ingots and castings fell off half a point in the week ended Mar. 5, production was at 99.5 per cent of practical capacity. Peak operations are being maintained by the nation's steelmakers despite reports that there is some easing in demand and that some manufacturers are not accepting all the steel being offered.

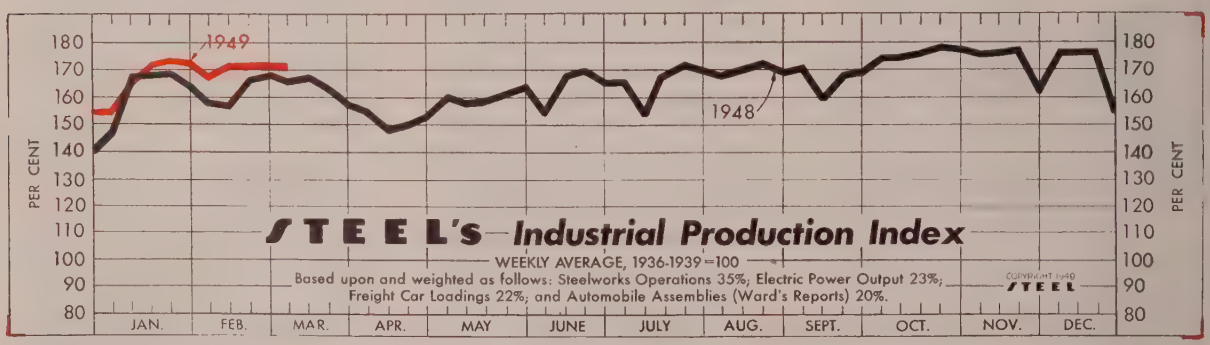
AUTOMOBILES — Outturn of passenger cars and trucks declined slightly more than 1000 units from the preceding week in the week ended Mar. 5, primarily because of a return to normal scheduling by a major producer. Total for the latest week was 117,764 passenger cars and trucks. The current picture in the industry is one of contrasts as some builders are trimming production schedules and others have announced plans for increased production in the March to June period. Estimated production by the automobile industry in February was 451,544 passenger cars and trucks.

CONSTRUCTION — Commerce Department reports that new construction put in place in February is valued at $1.1 billion. The February figure represents a normal seasonal drop of 9 per cent from January, but is 14 per cent above the February, 1948, total. Value of construction put in place during the first two months of this year is $2.4 billion, about 11 per cent above total for comparable period in 1948.

SALES—Manufacturers' sales declined slightly more than seasonally during January, according to the Commerce Department. Inventories increased about $400 million, of which roughly half represented a normal seasonal movement. Total value of sales during January was $17.1 billion, or $1 billion below the December aggregate. Sales of the durable group, amounting to $7.2 billion, were about equal to the December rate when usual seasonal fluctuations are taken into account.

INDUSTRIAL PRODUCTION—Federal Reserve Board's seasonally adjusted industrial production index was at 191 per cent of the 1935-1939 average in January, representing a decline of 1 point from December and 2 points from January, 1948. The index for durable goods was 229, unchanged from the like month a year ago but down 2 points from the December figure. Factory employment in January was at 155.2 per cent of the 1939 average, as compared with 158.5 in December and 161.2 in January, 1948.

COAL—Bituminous coal stockpiles on Feb. 1 were down 2.3 per cent from the aggregate of a month earlier. Bulk of the decrease, however, was in retail dealers' stocks with industrial stocks down only 100,000 tons. Total stockpile on Feb. 1 was 67.8 million tons.



Index (chart above): Week ended Mar. 5 (preliminary) 171 Previous Week 171 Month Ago 169 Year Ago 166

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	99.5	100.0	100.0	94.5
Electric Power Distributed (million kilowatt hours)	5,552	5,559	5,778	5,293
Bituminous Coal Production (daily av.—1000 tons)	1,803	1,793	1,743	2,154
Petroleum Production (daily av.—1000 bbl)	5,187	5,344	5,389	5,353
Construction Volume (ENR—Unit $1,000,000)	$118.6	$75.6	$209.7	$183.9
Automobile and Truck Output (Ward's—number units)	117,764	118,815	102,981	108,343

* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	713†	688	682	792
Business Failures (Dun & Bradstreet, number)	185	180	145	113
Money in Circulation (in millions of dollars)‡	$27,557	$27,551	$27,556	$28,024
Department Store Sales (changes from like wk. a yr. ago)‡	−7%	−9%	−7%	+4%

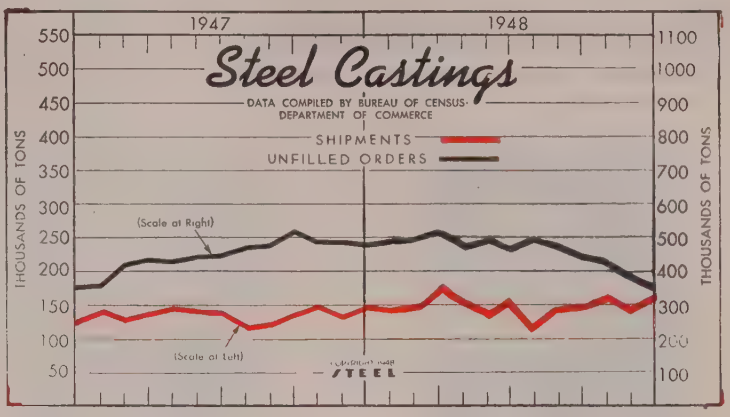
† Preliminary. ‡ Federal Reserve Board.

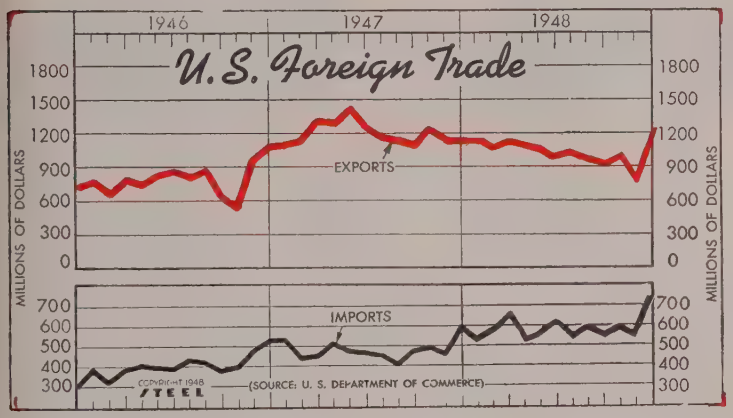
Steel Castings

(Net tons in thousands)

	Shipments		Unfilled Orders*	
	1948	1947	1948	1947
Jan.	141.1	139.0	491.7	365.5
Feb.	142.4	125.6	497.1	421.4
Mar.	162.9	134.9	508.8	434.9
Apr.	150.3	144.2	472.4	427.6
May	143.3	140.9	482.5	443.2
June	152.9	139.0	470.0	445.5
July	120.4	117.0	497.4	473.9
Aug.	140.2	120.4	472.5	478.6
Sept.	149.2	137.4	448.0	526.2
Oct.	153.0	148.4	424.5	497.3
Nov.	146.8	130.1	395.0	493.3
Dec.	157.4	148.1	354.5	489.4

* Castings for sale.





Foreign Trade

Bureau of Foreign and Domestic Commerce

(Unit Value—$1,000,000)

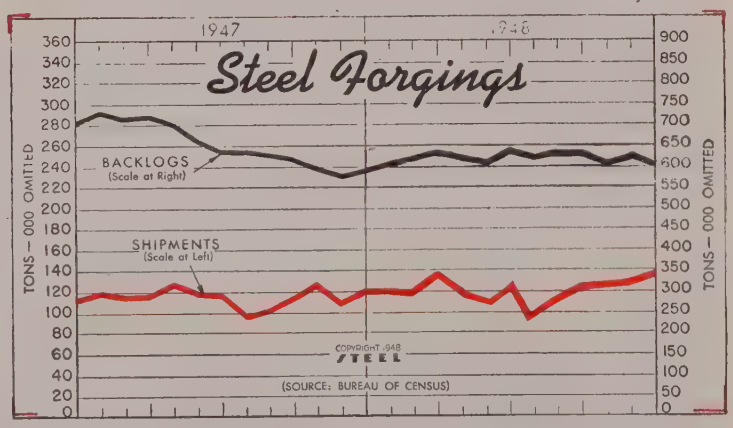
	Exports			Imports		
	1948	1947	1946	1948	1947	1946
Jan.	1,092	1,114	798	545	531	394
Feb.	1,086	1,146	670	582	437	318
Mar.	1,141	1,327	815	666	444	384
Apr.	1,123	1,299	757	527	512	406
May	1,103	1,503	851	549	474	393
June	1,013	1,320	878	616	463	382
July	1,022	1,265	826	559	450	431
Aug.	988	1,265	883	598	400	422
Sept.	926	1,109	643	558	481	377
Oct.	1,021	1,235	536	597	492	394
Nov.	820	1,138	986	550	454	478
Dec.	1,284	1,172	1,097	721	603	529

Steel Forgings

(Tons—000 omitted)

	Shipments*		Unfilled Orders*	
	1948	1947	1948	1947
January	118	116	618	723
February	117	111	631	714
March	131	115	641	717
April	114	121	628	699
May	109	116	624	663
June	120	112	641	639
July	97	92	627	631
August	111	98	634	626
September	121	109	631	617
October	123	124	605	594
November	124	104	621	586
December	132	117	601	594

* Forgings for sale.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,763	$11,421	$13,914	$14,541
Federal Gross Debt (billions)	$252.1	$252.6	$252.6	$254.2
Bond Volume, NYSE (millions)	$14.3	$14.8	$17.7	$18.6
Stocks Sales, NYSE (thousands)	3,930	3,427	4,686	3,827
Loans and Investments (billions)†	$61.9	$62.0	$62.9	$64.0
United States Gov't. Obligations Held (millions)†	$32,814	$32,890	$33,411	$36,281

† Member banks, Federal Reserve System.

PRICES

STEEL's Composite Finished Steel Price Average	$97.77	$97.77	$97.77	$81.14
STEEL's Nonferrous Metal Composite‡	232.6	232.6	232.6	189.5
All Commodities†	158.8	158.5	158.8	161.4
Metals and Metal Products†	177.9	178.1	178.3	155.7

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.

Men of Industry

H. W. MacINTOSH

E. CORBIN CHAPMAN

HENRY Z. CARTER

H. W. MacIntosh has been appointed treasurer of L. O. Koven & Bro. Inc., Jersey City, N. J., manufacturer of boilers, tanks, special process equipment and weldments. He has been in charge of purchasing and stores control for the past 29 years, and will continue in these activities.

—o—

Hydraulic Press Mfg. Co., Mt. Gilead, O., announces appointment of **J. P. Vederko** as works manager, succeeding **E. J. McSweeny,** formerly vice president in charge of manufacturing, who resigned. Mr. Vederko was formerly general superintendent of Cross Co., Detroit, designer and builder of special machine tools, and had previously spent eight years with Ex-Cell-O Corp., Detroit, in various production and engineering capacities.

—o—

Richard V. Bonomo, former secretary - treasurer, Schiavone - Bonomo Corp., Jersey City, N. J., has been elected president, succeeding **Louis Schiavone,** who has been elected chairman of the board of directors. **Herman D. Moskowitz,** past president of the Institute of Scrap Iron & Steel, continues as vice president of the company. **Emanuel J. Moskowitz** has been appointed treasurer, and **Alfred T. Sforza** will be secretary. **Murray Kunin** will continue as comptroller.

—o—

C. H. Benbrook has been appointed director of research and development, Ozalid Division, General Aniline & Film Corp., New York. In this capacity he will also assume full responsibility for quality control of the division's products. He joined American Cyanamid Co. in 1933 as a research chemist, and was associated with that company until 1943, when he joined the central research laboratory, in Easton, Pa., of General Aniline & Film Corp.

—o—

E. Corbin Chapman has been appointed chief metallurgist of Combustion Engineering-Superheater Inc., New York. He will continue to make his headquarters at the company's plant in Chattanooga, Tenn.

—o—

D. R. Stamy, associated with the automotive engineering field for over 27 years, has resigned as vice president in charge of engineering for Standard Products Co., Detroit, to become vice president and sales engineer with Tool Industries Inc., Detroit. Mr. Stamy has purchased an interest in the company, and will be active in its management.

—o—

W. C. Keeran has been elected vice president in charge of manufacturing operations for Roth Mfg. Co., Chicago, subsidiary of Vapor Heating Corp. Mr. Keeran joined the firm in 1941 as a production engineer, and in 1946 was made manager of production.

—o—

O. T. Henkle has been elected president of Mercury Mfg. Co., Chicago. Co-founder of the company more than 35 years ago, Mr. Henkle was secretary and treasurer for many years. As president he succeeds the late **Arthur G. Leonard.**

—o—

H. C. Peters, former vice president in charge of engineering, T. L. Smith Co., Milwaukee, has been appointed technical consultant of construction equipment, Blaw-Knox Co., Pittsburgh. Connected with the Smith company for 14 years in various sales and technical capacities, he previously had been with Hunter Tractor & Machinery Co., Milwaukee.

—o—

Henry Z. Carter has been appointed general manager, Avondale Marine Ways Inc., Westwego, La. For the past two years he has served as comptroller of the company. Mr. Carter had previously served many years with the federal government and the United States Maritime Commission in the capacity of general auditor, in charge of construction audits throughout the United States.

—o—

Alfred C. Howard, for many years associated with Fairbanks, Morse & Co., Chicago, has been named president and general manager of Globe-Wernicke Co., Norwood, O. He succeeds the late **J. S. Sprott.** Mr. Howard joined the Norwood company last fall as executive vice president.

—o—

John F. Widder has been appointed sales manager, Bolens Products Division, Food Machinery & Chemical Corp., Port Washington, Wis. He has been associated with the division for some years, recently as assistant sales manager.

—o—

Girdler Corp., Louisville, announces the appointment of **Harold E. Huber** as head process engineer of its Votator Division.

—o—

Joseph H. Treanor has been elected vice president of Mystic Iron Works, sales company in Boston for pig iron made at the blast furnace, in Everett, Mass., of Eastern Gas & Fuel Associates, of which the former com-

Is UPKEEP COST your magnet problem?

Although it looks and lifts like new, this Ohio Magnet is actually 22 years old. Until recently, upkeep cost was zero. Then a ground developed in the terminal box and the magnet was shipped to our plant, where repairs were quickly completed without disassembly.

Upkeep cost? Under $100—*less than $5 a year for 22 years!*

Next time you buy a lifting magnet, remember that heavier construction assures extra years of low-cost life. Send your order to Ohio—*25 years a leader in magnetic materials handling.*

This magnet averaged less than $5 a year!

OHIO PROTECTO-WELD MAGNET is welded *on top*, where weld cannot be dented in. Sizes include 39, 46, 55 and 65-inch diameters. Ohio also builds magnet control equipment.

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LUTHER A. KLEBER

BRUCE F. OLSON

pany is a subsidiary. Mr. Treanor is also vice president and general sales manager of New England Coke Co., another subsidiary company of Eastern Gas & Fuel Associates.

—o—

A. F. Anjeskey, sales manager, Cleveland Tramrail Division, Cleveland Crane & Engineering Co., Wickliffe, O., has been elected president, Monorail Manufacturers' Association, New York. **Wilbur Mayer,** sales manager, Louden Machinery Co., Fairfield, Iowa, has been elected vice president, and **E. Donald Tolles** was elected secretary-treasurer of the association.

—o—

N. L. Mooneyham and **John C. Lunkes,** until recently associated with Velsicol Corp., Chicago, have formed the Trabon Co., with offices at 122 S. Michigan Ave., Chicago, to operate as manufacturers representatives for foundry supplies, chemicals, insecticides and aromatic solvents.

—o—

American Society of Body Engineers Inc., Detroit, announces election of the following officers: **Arthur L. Bradley,** chief engineer, Wettlaufer Mfg. Co., Detroit, president; **Carl W. Cenzer,** body development engineer, Hudson Motor Car Corp., Detroit, vice president; **Harold V. Atnip,** Chrysler Corp., Detroit, secretary, and **William K. Norwick,** executive assistant to director of the Engineering Division, Fisher Body Division, General Motors Corp., Detroit, treasurer.

—o—

Hanford Haynes, active for many years in the field of steel fabrication, has been placed in charge of a new sales office opened in Seattle by Consolidated Western Steel Corp., a United States Steel Corp. subsidiary.

—o—

Charles DeZutter has been named superintendent of Republic Steel Corp.'s bessemer finishing and rolling mills at Youngstown; **E. H. Callahan** was named assistant superintendent, and **Charles R. Leonard,** assistant superintendent of the electrical department.

—o—

General Steel Castings Corp., Granite City, Ill., announces appointment of **Luther A. Kleber** as assistant vice president-manufacturing, in charge of its plants at Eddystone, Pa., and at Granite City, where he will have headquarters.

—o—

J. L. Young Jr., sales representative for Wolverine Tube Division, Detroit, Calumet & Hecla Consolidated Copper Co., has been promoted to manager of southwestern sales with offices in Houston, Tex.

—o—

Harold F. Mosher has been named manager of the Dallas district, industrial products sales department, B. F. Goodrich Co., Akron. He succeeds the late **R. T. Kain.** Mr. Mosher has been manager of special industrial merchandise sales for the past six years, and is succeeded in that post by **D. W. Raleigh.**

—o—

Fred A. Pritzlaff, foundry superintendent, Falk Corp., Milwaukee, has been named consultant to the vice president and works manager, and **Carl Haertel** has been made foundry superintendent, succeeding Mr. Pritzlaff.

—o—

Three promotions in the Middletown, O., Division of Armco Steel Corp. are as follows: **William F. Dannecker,** since 1947 assistant to superintendent, steel plant production, at East Works, has been appointed assistant to superintendent at the blast furnace of the company's Hamilton, O., plant; **Norman R. Trisler,** recently on special assignment in the electrical melting operation at Butler, Pa., plant, has been appointed general foreman, electric melting department of the company; and **James S. Miller,** since 1947 on special assignment in the training section, has been appointed instructor in that section of the personal relations department.

—o—

Sundstrand Machine Tool Co., Rockford, Ill., and subsidiary, American Broach & Machine Co., Ann Arbor, Mich., announces election of **Bruce F. Olson** as president and general manager, succeeding his father, the late **Hugo L. Olson. O. G. Nelson** has been elected chairman of the board of the company. **Gilmore J. Landstrom** and **Gust H. Ekstrom,** directors of the firm, were elected vice presidents, and **Howard H. Ekstrom** was made assistant secretary and treasurer.

—o—

R. L. Batteiger, president of Coatesville Plate Washer Co., Coatesville, Pa., has been elected district chairman for 1949 of the Philadelphia district, Pressed Metal Institute. He will also become a member of the board of trustees of the institute. **Walter A. Gorrell,** president, E. J. McAleer & Co., who was chairman of the Philadelphia district, retains his post as vice president.

—o—

John M. Mulholand has been appointed traffic manager of Youngstown Sheet & Tube Co., Youngstown, effective Apr. 1. He previously served as manager of railroad sales.

—o—

Donald N. Hildebrand has been appointed assistant superintendent of Republic Steel Corp.'s continuous tube mills, Youngstown, succeeding **Roy Case** who was appointed superintendent.

—o—

Ira Monroe has been elected vice president and general manager, Mc-

Cleery-Carpenter Co., Columbus, O., and **Harry Fell** has been named treasurer.

—o—

H. E. Cardoze, formerly assistant manager, marketing & analysis department, Nash Motors Division, Nash-Kelvinator Corp., Detroit, has been appointed used car manager of Nash Motors.

—o—

Farrel-Birmingham Co. Inc., Ansonia, Conn., announces appointment of **M. H. Blank** as representative in the Detroit area to handle the sale of gears and gear units manufactured at the company's Buffalo plant.

—o—

Kenneth F. Vilsack has been appointed Chicago district sales representative of Kerotest Mfg. Co., Pittsburgh. He was previously connected with the Pittsburgh general sales office.

—o—

W. F. Emery has been appointed district manager of the Detroit office of Bristol Co., Waterbury, Conn. He has been associated with the Detroit office as a sales engineer since 1926.

—o—

Leslie Edgcomb Jr., Charlotte, N. C., was elected a member of the board of directors of Edgcomb Steel Co., Philadelphia.

—o—

Allison R. Maxwell Jr. has been appointed assistant general manager of sales, Pittsburgh Steel Co., Pittsburgh. He became associated with the company in 1935, and since that time has held various company positions.

O. W. YOUNG

Appointed executive assistant to the general manager, Buick Motor Division, General Motors Corp., Detroit. Noted in STEEL, Feb. 28 issue, p. 70

—o—

Howard M. Givens Jr. has been appointed general manager, tool and high speed steel sales, Crucible Steel Co. of America, New York. He formerly was manager, bar and roll sales, for Midvale Co., Philadelphia. Mr. Givens has specialized in tool, high speed, and special alloy steel sales, and during the war, while employed by Allegheny Ludlum Steel Co., he served on the Tool Steel Advisory Committee to the WPB.

—o—

George S. Morrison has been named manager of a new sales zone recently established at Denver by Pontiac Motor Division of General Motors Corp., Detroit. Mr. Morrison has held assignments as office manager and car distributor at San Francisco and Los Angeles, and district manager and business management manager at Los Angeles. He will be assisted at Denver by **William H. Hunter,** former district manager in New York, as business management manager; **G. E. Corington,** office manager and car distributor; **W. W. Boggess,** service manager; **G. E. Hentschell,** parts and accessories merchandising manager; **A. W. Greenawalt** and **H. J. Gordon,** district managers, and **R. P. MacDuff,** service adjuster.

—o—

Bradley C. Higgins has been appointed vice president and purchasing agent for Livingstone Engineering Co., Worcester, Mass.

—o—

Henry J. Kingsbury has retired as chief engineer of Hammond Machinery Builders Inc., Kalamazoo, Mich., but will continue active with the company in its engineering research and development. Mr. Kingsbury has been associated with the company for 50 years, and continues now on a partial retirement.

—o—

Ex-Governor Charles Edison of New Jersey, **John F. Kidde,** president, Walter Kidde & Co. Inc., New York, and **Edwin J. Schwanhausser,** vice president in charge of sales, Worthington Pump & Machinery Corp., East Harrison, N. J., have been elected to the board of trustees of Stevens Institute of Technology.

OBITUARIES . . .

Charles H. Longfield, 56, vice president and general sales manager, Youngstown Sheet & Tube Co., Youngstown, died Mar. 6 in Belleair, Fla., from a heart attack. He joined the Youngstown company in 1932 as general manager of sales, and last April was elected a vice president. During the war he served as chairman of a committee of the Steel Division, WPB. He previously was with Kirk-Latty Bolt & Nut Co. as a salesman, and when this company was purchased in 1926 by Lamson & Sessions, Mr. Longfield became vice president in charge of sales and a director.

—o—

Joseph P. Busher, 61, Detroit representative for Ackermann Mfg. Co. and Wheeling Corrugating Co., and special representative for C. Cowles & Co., died recently at his home in Euclid, O. Mr. Busher's connection with the two subsidiary companies of Wheeling Steel Corp. covered a period of 17 years, and during the past several years he maintained offices at Detroit. He previously was vice president and general manager of Geometric Stamping Co., Cleveland.

—o—

Daniel D. Eyster, 52, a consulting engineer and former president, Acro Welder Mfg. Co., Milwaukee, died Feb. 27.

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M. W. Latimer, 61, manager, Hercules Powder Co. office in Joplin, Mo., died Feb. 23.

—o—

Fred A. Sunderlin, 78, retired president, Philco Corp., Philadelphia, died Feb. 26 in Miami, Fla.

—o—

A. Atwater Kent, 75, pioneer inventor and manufacturer, died in Los Angeles Mar. 4. In 1902 he established the Kent Mfg. Works, Philadelphia, for production of telephone and automobile parts. In 1919 the concern was incorporated as Atwater Kent Mfg. Co., for large-scale manufacture of vacuum-tube radios.

—o—

Harry P. Anderson, 58, for eight years secretary-treasurer, American Bridge Co., Pittsburgh, died of a heart attack Mar. 7.

—o—

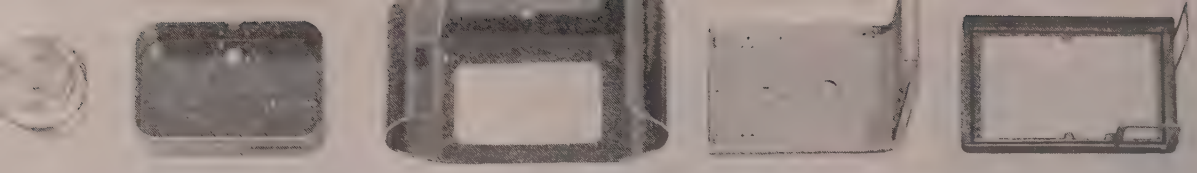
Wilfred G. Lane, 64, inventor of the gun perforator for steel oil well casing, and one of the founders of Lane-Wells Co., Los Angeles, died Mar. 3. He retired in 1938.

—o—

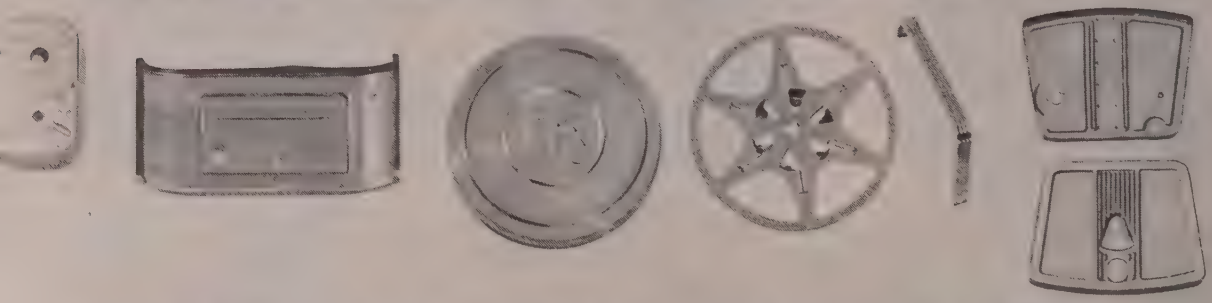
Isaac Preeman, for more than 40 years associated with T. D. Cummer & Son Co., Cleveland, died Mar. 5. For many years he served as vice president and general manager of the company.

—o—

Eric Burkman, 56, secretary, United States Rubber Co., New York, died of a coronary thrombosis while on vacation in St. Thomas, Virgin Islands.



HOW BLISS PRESSES



ARE IN THE PICTURE

AT EASTMAN KODAK

A variety of Eastman Kodak parts produced on Bliss presses at the Camera Works.

EASTMAN KODAK'S outstanding success at mass-producing quality photographic equipment at low cost is the result of ever-alert, scientific manufacturing methods. This means that all metal-working machinery must measure up to exacting standards and policies.

Bliss is very much a part of the Kodak picture. The high percentage of Eastman press equipment is Bliss-built, comprising presses of virtually every type.

The reasons for Eastman's continuous specification of Bliss are satisfactory performance under intensive operating conditions, prompt maintenance and repair service, and engineering cooperation when new designs and tooling are up for consideration.

These are the reasons for Bliss' unrivalled leadership wherever you look in the pressed metal field—throughout the automotive, aircraft, railroad, electrical, household appliance and many other industries. It's because Bliss has always built and delivered more than a press: it provides a fund of production engineering knowledge that goes back over 90 years.

You can get the most out of *your* pressed metal production by sending for a Bliss sales engineer today.

See our Catalog in SWEETS or write for Bulletin No. 35-B

BLISS BUILDS MORE TYPES AND SIZES OF PRESSES

Engineering News . . . AT A GLANCE

MECHANICAL DETECTIVE—An infrared detector—a device used by the Germans to hunt ships during the war—now is being used to track down overheated power line joints, it was revealed at the recent meeting of the American Institute of Electrical Engineers in New York. It was pointed out that in a 2-month period more than 300 transmission-line joints were checked with the unit. With it, joint temperatures can be measured with the line in normal operation by merely setting up the detector's tripod to one side of the line and sighting the device on the joint. Procedure takes less than 5 minutes.

INCREASED EFFICIENCY— Combined design changes in blading, wheel, inlet, back plate and scroll enabled engineers of Westinghouse Electric Corp., Pittsburgh, to boost the efficiency of a new industrial centrifugal fan to a new high. According to the company, unit reaches a static efficiency of 80 per cent—a factor in power savings that could easily amount to more than 20 per cent of the fan's cost within a 5-year period. Most significant of changes is design of the scroll, spiral housing that surrounds the revolving blades. This was made steeper near the wheel to provide greater airflow uniformity. Of the 23 sizes soon to go into production, the largest model stands 18 feet high. It is capable of moving 480,000 cu ft of air per minute, or 1080 tons of air every hour.

ISOLATES HARDENING AREAS— Method that is both effective and economical for keeping a portion of a workpiece soft while the rest is carburized is reported by Denfis Chemical Laboratories Inc., Brooklyn, N. Y. It consists of applying a specially developed paste to sections to be kept soft, leaving it there while the work is being case hardened. According to the company, the product prevents penetration of carbon gas and insulates the protected section to prevent rapid cooling.

MULTIPLE-SECTION BUMPERS— Massive bumpers currently used on Cadillac cars are made in multiple sections—three sections for the front bumper, and five for the rear component. In General Motors' Cadillac plant, all of these sections are made individually, metal finished and electroplated separately, then welded together to form the final assembly. Only exceptions are the end sections of the rear bumper. Fender tips are welded to the end bar section of these before plating to permit metal finishing and plating as a single unit providing a one-piece appearance. Three principal sections of front and rear bumpers are assembled in a massive fixture that holds them securely, and in alignment for arc welding. Water-cooled stations in the fixture confine the heated area to a narrow zone at the welded joints.

REDUCES TESTING PERIOD— Disintegration test on blast furnace lining bricks now can be made more quickly and effectively with the semiautomatic equipment and testing procedure developed at the Gary Works of Carnegie-Illinois Steel Corp. The equipment, it is reported, consists of a gas-tight chamber, pump for circulating carbon-monoxide gas, absorption tubes to remove carbon dioxide and moisture, flow meter and pressure gage. In making a test, brick specimens in the test chamber are heated to 950° F, then exposed to action of a 20-cubic-foot-per-hour flow of carbon monoxide gas for about 40 hours. Forty hours of testing in this equipment was found to be much more effective than 120 hours in previous equipment.

CORROSION CAUSES MANY — Localized corrosion of metal surfaces is often attributed to presence of impurities in the corroding metal. However, it is revealed, there are a number of other causes that are of far more practical importance. These include metallurgical factors, surface roughness, differential strain and several others. Under severe conditions, for example, heat of welding is likely to cause inhomogeneities. A zone on either side of the weld where the metal is heated and cooled at some optimum rate could throw cathodic impurities out of solution. (p.86)

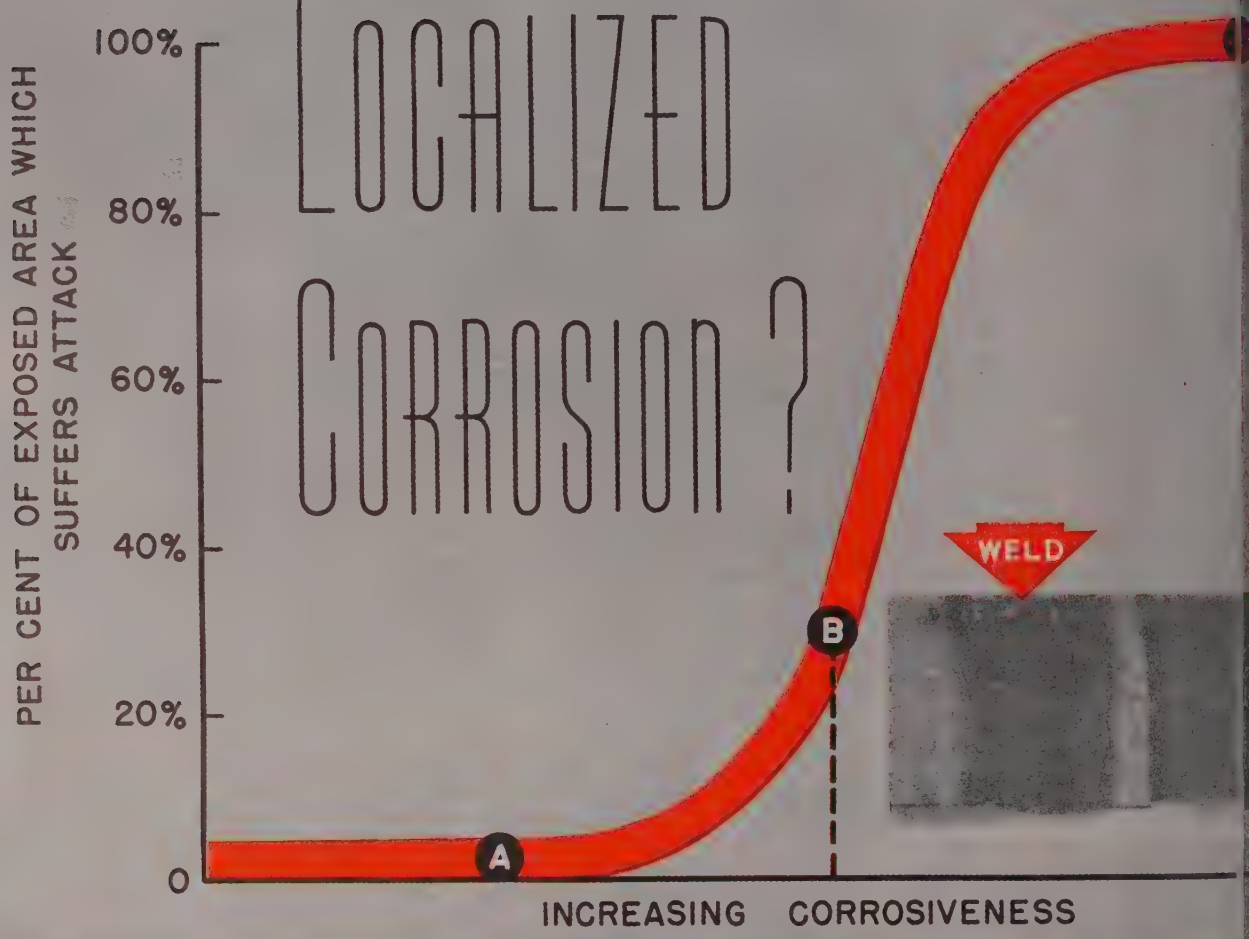
FAST BENCH TECHNIQUE—Entire operation in an improved method of setting diamonds in various sizes of wheel dressing tools, currently used by Ford in Dearborn, Mich., is done on a small bench and involves only three pieces of equipment. Success of the technique stems from a powdered metal employed in setting the diamonds. Material is a mixture of cadmium, copper, chromium and nickel powders combined with a special fluxing agent. (p.90)

MATTER OF EDUCATION—In reviewing the six most common methods of specifying steels, Charles M. Parker of the Iron & Steel Institute points out that a steel consumer always thinks only in terms of quality, whether he recognizes it or not, because he always has a specific end-use in mind. On the other hand, a steel producer thinks in terms of making good steel based on a clear understanding of the consumer's requirements. Each of the methods provides distinct advantages to either producer or consumer. (p.91)

JOB FOR A SPECIALIST—Quality control generally is thought of as dealing entirely with sampling procedures which present and solve risks involved in accepting and rejecting material. In a large, self-contained industry dealing with large units such as a 150-ton open hearth heat of steel, which is made far in advance of its ultimate fabrication, the place and importance of statistical quality control is of a different nature. To cope with the many problems that present themselves in such an industry, the services of a quality control engineer is required (p.102)

News Summary—p. 55 *Market Summary—p. 149*

What Causes LOCALIZED CORROSION?



LOCALIZED attack of metal surfaces is often the result of electrochemical corrosion, not of simple chemical solution. In many neutral solutions the corrosion of the common structural metals appears to be associated with the flow of electric currents between various parts of the metal surface at finite distances from one another. This is supported by much qualitative evidence and, in the case of steel and aluminum, the quantities of current flowing during corrosion account for the amount of corrosion which occurs. Some of the causes of localized corrosion of metals were discussed recently by R. B. Mears, manager, research laboratory, Carnegie-Illinois Steel Corp., Pittsburgh, before the Niagara Falls, N. Y., section of the Electrochemical Society.

According to Dr. Mears, localized corrosion of metal surfaces is often attributed to the presence of impurities in the corroding metal; however, there are a number of other causes of localized attack which are of far more practical importance than are impurities or constituents. Other known possible causes are: 1. Metallurgical factors, including grain boundaries, orientation of grains, differential grain size, and differential heat treatment; 2. surface roughness, including local scratches and abrasions; 3. differential strain; 4. differential pre-exposure to air or oxygen; 5. differences in degree of aeration, heating illumination and agitation; 6. difference in shape and contact with dissimilar metal; 7. certain complex cells may influence the corrosion factor and externally applied potentials have been found to be responsible for certain severe cases of corrosion.

Throughout the course of the discussion Dr. Mears made frequent reference to the basic corrosion curve shown in Fig. 1 which shows the relationship between increasing corrosiveness and per cent of exposed area of metal surface which suffers attack. Referring to this curve, it was brought out that in the region from O to A there is virtually complete resistance to corrosion; in the region from A to C corrosion occurs on

While localized corrosion of metal surfaces is often attributed to the presence of impurities in the corroding metal, a number of other causes are of far more practical importance. These include metallurgical factors, surface roughness, differential strain and several others

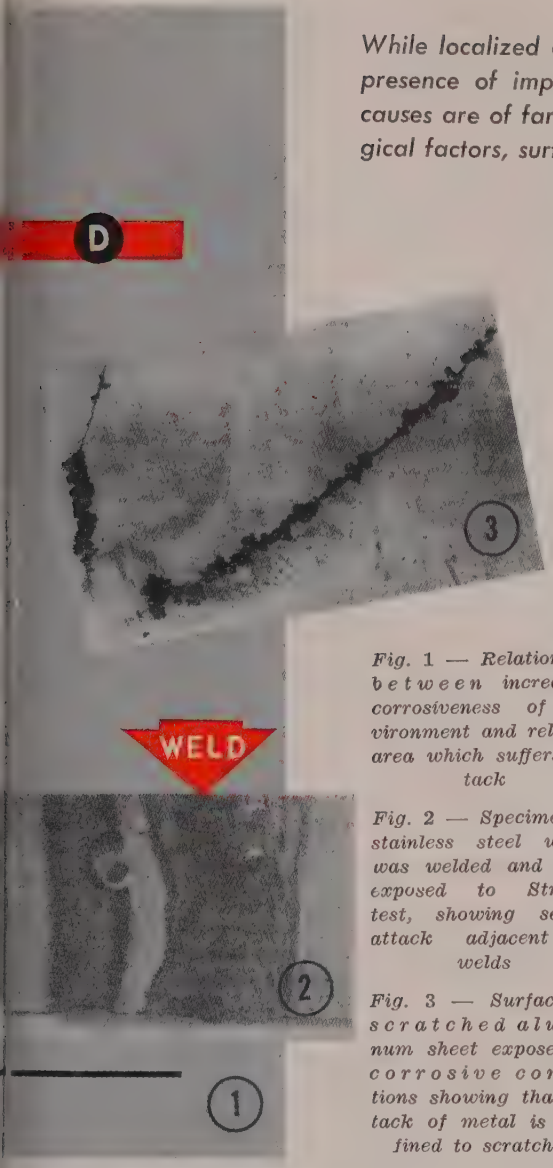


Fig. 1 — Relationship between increasing corrosiveness of environment and relative area which suffers attack

Fig. 2 — Specimen of stainless steel which was welded and then exposed to Strauss test, showing severe attack adjacent to welds

Fig. 3 — Surface of scratched aluminum sheet exposed to corrosive conditions showing that attack of metal is confined to scratches

part but not all of the exposed surface. It was pointed out that this is the region where localized corrosion occurs. From C to D virtually the entire exposed area suffers attack. Most severe localized corrosion, that is, the deepest pits in the metal surface generally occur in the region A to B.

Metallurgical Factors—Practically all metal parts of a size which is commercially important are made up of a multitude of individual grains or crystals. It is clear that the boundary between any two grains is a region that is definitely heterogeneous compared with the body of the grain. Potential measurements were brought out by Dr. Mears which indicated that the potentials of grain-boundaries of a high-purity aluminum differ from the potentials of the grain centers in 20 per cent hydrochloric acid, when the metal is in the annealed condition or has been given a solution heat treatment. Other alloys such as aluminum-copper, brass and stainless steel have been studied.

According to Dr. Mears there is evidence that electrochemical effects enter into the intergranular corrosion of stainless steel. In this connection, the solution potential of a sample of 18-8 stainless steel which had been treated so as to precipitate the chromium as chromium carbide was measured in comparison with the solution potential of a similar sample of 18-8 which had been quenched from the heat-treating temperature so as to retain the chromium in solid solution. Results showed that the sample in which precipitation of the chromium had occurred was anodic to the other sample by 0.09-volt in a sodium chloride solution containing hydrogen peroxide. It has been proposed[1] that the material adjacent to the grain boundaries in stainless steels may become depleted in chromium by precipitation; then it follows that galvanic action between such depleted areas and the body of the grains will occur in certain solutions.

In addition, the solution potentials of a series of iron alloys containing various amounts of chromium in solid solution were measured. The results showed that increasing the amount of dissolved chromium in the alloy definitely altered the solution potential in a cathodic direction, and thus again indicated that electrochemical effects are important in the intergranular corrosion of 18-8 stainless steels.

Welds—If one portion of a metal surface is subjected to a different thermal treatment from that of other parts of the surface, differences in potential between these two regions may occur, which may give rise to localized corrosion. Under severe conditions the heat of welding is likely to cause such inhomogeneities; there are numerous instances of special attack caused by the presence of welds. In this case, as was pointed out by Dr. Mears, it is not generally the weld bead which is anodic, if the weld wire used was of the same alloy as the material being welded, but usually a zone on either side of the weld where the metal was heated and cooled at some optimum rate which would throw cathodic impurities out of solid solution. A typical example of special attack adjacent to a weld is illustrated in Fig. 2. In this case the specimen is 18-8 stainless steel, welded and then exposed to acidified copper sulphate solution.

To illustrate the point, Dr. Mears presented data on the solution potential of a welded 53S-T aluminum alloy specimen measured at the weld and also at various distances from the weld, Table I. A band of metal about 1.5 inches from the weld had the most anodic potential. When welded 53S-T specimens of this type were exposed to a corrosive salt solution, it was stated by Dr. Mears that attack was largely confined to this anodic band. If the welded 53S-T plate was either annealed or given a solution heat treatment, and subsequently aged at an elevated

temperature, the differences in potential between various portions of the plate were greatly reduced, as shown in Table I.

Effects of this kind, Dr. Mears pointed out, are not confined to the two alloys cited as examples but are general. Whenever local heating results, either in changing the nature of the phases present or their compositions, differences in potential are likely to occur.

Surface Roughness—The condition of a metal surface may also result in potential differences which are associated with electrochemical corrosion. Highly polished metal surfaces may exhibit different solution potentials from those of rough abraded surfaces. One reason cited by Dr. Mears, is the possibility that any film which forms on the rough surface will be much less continuous than a film formed on a smooth surface. Table II gives measurements on potentials between rough and smooth surfaces for several materials.

Potential differences caused by local scratches or abrasions are related to those just discussed. Such potential differences, it was pointed out, are among the most important causes which determine the sites of local attack. The effect of scratches in determining sites of attack is most pronounced in environments where the metal in question forms adherent and protective films of corrosion product. Thus, it can be seen that if the entire metal surface is attacked and the corrosion products which are formed are soluble, scratches may not be points of special weakness. As a result, this phenomenon is most in evidence when the metal in question resists attack by forming a protective layer. In corrosive salt solutions, attack of large flat surfaces of aluminum alloys is often confined largely or entirely to accidental scratches. Fig. 3 illustrates this type of attack for an aluminum alloy article which was employed in service.

TABLE I
POTENTIALS OF ALLOYS AT VARIOUS DISTANCES FROM WELD

Condition of 53S-T Alloy	Distance from Weld, inches	Volt, Potential*
As welded	1	—0.840
	4	—0.847
	7	—0.830
	9	—0.825
After annealing	1	—0.842
	4	—0.842
	7	—0.840
	9	—0.839

* Measured in solution containing 53 grams NaCl and 3 grams H_2O_2 per liter against 0.1 N calomel cell.

TABLE II
EFFECT OF SURFACE ROUGHNESS ON SOLUTION* POTENTIAL

Metal	Surface Condition	Initial Potential against 0.1 N Calomel Cell, Volt
Aluminum (2S-½H)	Metallographic polish	—0.855
	Electrolytic polish	—0.854
	000 emery paper	—0.849
	Microtome cut	—0.990
	No. 120 Aloxite	—0.817
Copper	Metallographic polish	—0.307
	000 emery paper	—0.338
	No. 120 Aloxite	—0.378
Steel	Metallographic polish	—0.438
	000 emery paper	—0.597
	No. 120 Aloxite	—0.627

* 10% sodium chloride at 25°C.

SEEN AND HEARD IN THE *Machinery Field*

By GUY HUBBARD
Machine Tool Editor

A. B. EINIG—AN APPRECIATION: With the death of Alvin B. Einig on February 27, 1949, the machine tool industry lost a distinguished man—one known and respected far beyond the intimate circle of that industry.

Before joining Motch & Merryweather Machinery Co. as a salesman 40 years ago, Mr. Einig laid a solid foundation for his career by serving his time as an apprentice machinist and by completing a four year course in mechanical engineering at Case School of Applied Science. He was a sales engineer in the best sense of that term. In that role he won and held the confidence of many industrial leaders including Henry M. Leland, the Wright brothers, Glenn H. Curtiss and William S. Knudsen. Deservedly, he eventually became general manager of his company.

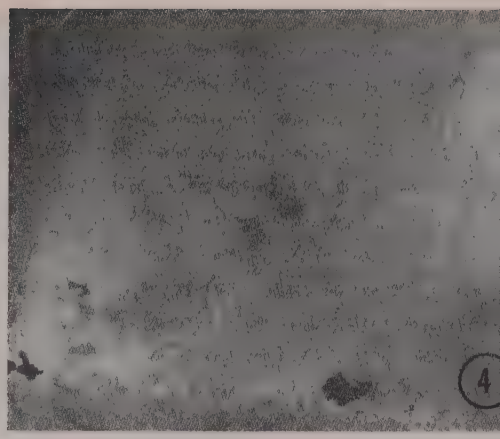
When General Knudsen went to Washington to take charge of the Office of Production Management (later the War Production Board) one of the first assistants he "drafted" from industry was A. B. Einig—who served throughout the critical tooling up period as administrative officer of the Tools Division. Under the late George Merryweather, he had worked in a similar capacity on the War Industries Board during World War I. Also within recent months he had been called in as a consultant in the setting up of the National Security Resources Board.

The crowning achievement of Mr. Einig's long career in public service was the report which he wrote as a machine tool specialist of the United States Reparations Mission (the Pauley Mission) which made a world girdling flight, May-September, 1947, to study industrial conditions in the Far East, in Europe and elsewhere for the State Department.

To several of us here in the Penton Building, Alvin B. Einig was more than just good neighbor. Earl Shaner, editor-in-chief of STEEL, flew around the world with him as a fellow member of the Pauley Mission. Frank Steinebach, editor of *The Foundry*, was a fellow executive on the War Production Board in Washington. John Greve, managing editor, *Machine Design*, was closely associated with him in the management of the Cleveland Engineering Society. Over a period of 19 years I was with him on many memorable expeditions — including two weeks at Cornell University in July of 1948.

While writing this, a letter came from the vice president and general manager of a large and well

Fig. 4—Aluminum alloy (38) showing local spots of corrosion attack caused by differential aeration. Specimen was in contact with wet hair felt. However, other absorptive insulating materials are also likely to be corrosive when wet



Measurements have shown differences in potential between edges and centers of metal sheets. Often the edges are rough and uneven, and there are ragged and torn metal fragments which have a large ratio of surface area to volume. In addition, if the metal was sheared, the edges have been subjected to severe cold working which may also cause them to be more readily attacked in certain environments. However, one point was emphasized by Dr. Mears is that cold working does not always produce special susceptibility to attack; in fact, cold worked materials may even prove more resistant than annealed materials in certain cases. It is generally not possible to predict whether the edges or center of a sheet of metal will be most susceptible, but, it is a general rule that the edges will probably behave differently from the center.

Differential Strain—While strain hardening may contribute to special edge attack, such behavior is not necessarily confined to the edges. Any portion of a specimen subjected to plastic deformation may have a different solution potential from a similar specimen which has not been deformed. Several cases of special corrosion resulting from this phenomenon have been reported.

Oxygen Screening—Another type of corrosion may result from differential aeration, and is of great practical importance. If different amounts of oxygen are dissolved in different portions of the liquid in contact with metal surface, special attack is likely to occur at those areas in contact with the liquid of the lowest oxygen concentration. Thus, if some inert, absorptive mass is pressed against a portion of a metal surface immersed in an aqueous solution, less oxygen can diffuse to the screened portion. As a result, corrosion currents are generated between the screened and unscreened areas. This has been known to result in extremely rapid local attack in many cases.

It is this relationship which causes the severe attack of stainless steel (*Please turn to Page* 128)

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known machine tool company. This letter expresses our feelings perfectly in these concluding words: "I shall always remember A. B. Einig as one of the friendliest and ablest men I have known anywhere."

ENGINEERING FISSION: Robins herald the approach of Spring to many people. Engineering meetings herald the approach of Spring to me. As soon as this page is completed, I will have packed my bag and departed for the Spring Meeting of the American Society of Tool Engineers in Pittsburgh.

The extent to which technical societies have multiplied in America within recent years reminds me of the experience of the sorcerer's apprentice and the broom, which he "galvanized" into carrying buckets of water. When he chopped up the broom all the pieces materialized as water carriers.

When the "fission" of American engineering societies will end—no one knows. The possibilities for continued fission seem endless, but the physical ability of engineers to attend meetings in which they are vitally interested has just about reached its limit. The same is true of their dues-paying ability.

Older societies have stopped fission to some extent at least by establishing sections and divisions within the main body. This ordinarily has been done, however, only after influential groups already had escaped much as our "Thirteen Colonies" got away from the British Empire.

Americans are inveterate "joiners". If they can't get into one organization they will start another—as is proved by the number of civic service clubs listed on the bulletin boards of any leading hotel.

It may be that our answer lies in raising standards for "top membership"—but at the same time making our engineering societies educational to such a degree that "apprentice" members who really have it in them can be inspired and helped to work their way up to the higher degrees.

ACTIVE RETIREMENT: One of STEEL's readers of long standing—A. B. Bolender, 711 University Avenue, Muncie, Ind.—has just written to announce that on his birthday, February 28, he retired after 39 years with Warner Gear Co.

Mr. Bolender is one of the pioneers of the gear industry as we recognize it today. In his letter he makes the following interesting statement:

"I was the originator of gear shaving. I started out with rack shaving and of course the circular shaving is copied from rack shaving. I am proud to have been able to produce quality gears in America, as it has saved millions of dollars—especially for motor car manufacturers—and also has saved wear and tear on those responsible for gear quality."

In this "active retirement", Mr. Bolender will devote some of his time to lecturing and to consulting work on gear production and quality control. I hope that some tool engineering group within my orbit books him for a talk. Men like him who have devoted their lives to the gear industry, have contributed tremendously to the cause of American industry.

Fast Method of Setting Diamonds in

WHEEL DRESSING TOOLS

Involves Use of Powdered Metals

IMPROVED method for setting diamonds in various sizes of wheel dressing tools is now in use at the Ford Motor Co., Dearborn, Mich., based on principles and equipment developed by Harry L. Strauss Jr., of National Diamond Hone & Wheel Co., New York. Entire operation is set up on a small bench and involves only three pieces of equipment as shown in accompanying illustrations.

Tool bits are in six different sizes and are of round steel bar stock about 2 inches in length. One end is drilled to a depth of ¾-inch in a bench lathe to accommodate the metal in which the diamond is to be set. As shown in Fig. 1, the drilled end is next filled with powdered A-metal contained in a small hopper.

This material is a mixture of cadmium, copper, chromium and nickel powders, together with a special fluxing agent, particle size averaging 1-3 microns or in the neighborhood of 300 mesh. It is a proprietary analysis developed by F. H. Willey of the Willey's Carbide Tool Co., Detroit. A-metal powder has been used for some time in diamond setting at the plant of Ford Motor Co. of Canada, although only recently was it adapted to the equipment installed for this work at manufacturing services building of the Ford Rouge plant.

Compacted by Hand Press—The powder is compacted in the drilled bit by (*Please turn to Page* 131

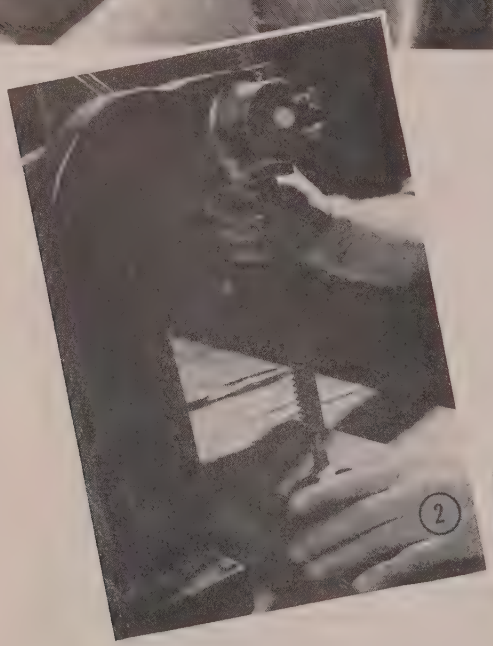


Fig. 1—Hollow end of tool bit is filled with powdered material from hopper in first stage of diamond setting operation

Fig. 2—Diamond is centered in the filled bit and tamped into the compacted metal powder with hand press and punch

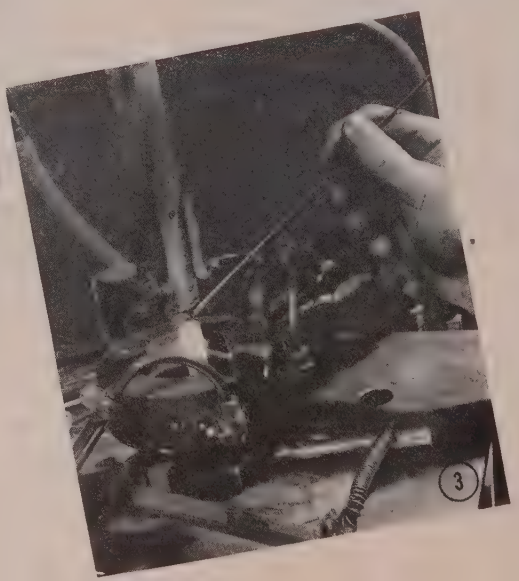


Fig. 3—Heated in ring gas burner, powdered metal fuses while silver solder is added to strengthen setting of diamond

How Steel Producers View STEEL COMPOSITIONS AND SPECIFICATIONS

Carelessly-prepared steel specifications can be costly to both producer and consumer. Improperly-used words such as "quality," "grade," "type" and "kind" are sometimes the cause of additional unnecessary expense. Here the author defines those elusive terms, reviews the influence of current raw materials problems on steel compositions and goes on to examine the six most common methods of specifying steels

By CHARLES M. PARKER
Secretary, Committee on Manufacturing Problems
American Iron & Steel Institute
New York

IT is unavoidable that steel specifications must be discussed against the background of the raw materials which are now available to steel producers. It is also unavoidable that past conditions exert an important influence on present conditions and that those, in turn, may have important effects in the future.

Unprecedented production of iron and steel in recent years has depleted our reserves of high grade raw materials to such an extent that the remaining materials are either inferior in quality or remote from established centers of steel production. The inferior quality of those raw materials imposes difficult technological problems, some of the consequences of which may have to be passed on to consumers of steel either temporarily or permanently, depending upon their successful solution and economic application.

Iron content of Lake Superior ores has been declining steadily in recent years and silica content has been rising. Table I gives the iron and silica contents of typical blast furnace ores.

Scrap which is presently available to the steelmaker is lighter than is desirable. Morover, it is contaminated with nonferrous metals, many of which are not removed in the steelmaking process. Light scrap results in higher than normal metal losses, favors abnormal pickup of sulphur from the available high sulphur fuels, causes damage to furnace walls and roofs, and adds to the time required to make a heat of steel.

Range of incidental elements in alloy steels is under study by the American Iron and Steel Institute's Technical Committee on Alloy Steel Bars. That study, still in progress, reveals that 7902 open hearth heats made during 1946-1947 had a weighted average nickel content of 0.108 per cent and a range of 0.00 to 0.50 per cent nickel. The weighted average nickel content of 1555 heats made during 1943 was the same, namely, 0.108 per cent.

For chromium in 5591 open hearth heats made during 1946-1947 the weighted average was 0.077 per cent, and the range was 0.00 to 0.45 per cent chromium. Weighted average for 916 heats made during 1943 was lower, namely, 0.063 per cent chromium. Weighted average of molybdenum in 6083 open hearth heats made during 1946-1947 was 0.023 per cent, which is practically the same as the weighted average of 0.024 per cent molybdenum for 540 heats in 1943. Molybdenum range of the 1946-1947 heats was 0.00 to 0.16 per cent.

It is significant that the weighted average of those elements for 1946-1947 was approximately equal to or greater than the corresponding averages for 1943.

Coke—Quantity of coke necessary to produce a ton of pig iron has been rising slowly but steadily for many years[1]. Although the yield of coke from coking coal has remained almost constant, the quality of coke has deteriorated. Ash content of coke has increased from about 6 per cent to about 12 per cent, because the best coal has been mined and mechanical mining and loading bring more debris to the surface. Moreover, large quantities of strip-mine coal are being used. Such coals commonly contain large quantities of oxidized or semioxidized surface material which cannot be segregated and removed economically. In addition, the sulphur content of coking coals has

From data presented by the author before the SAE annual meeting, Detroit, Jan. 10-14, 1949

risen from 0.5 per cent to 1.5 per cent and the properties of the resulting coke, its size, porosity and consequent ability to bear the burden of ore and limestone in the blast furnace, have deteriorated. That means that additional limestone must be used to flux off the impurities in the ore, a fact reflected in the statistics[2].

Quantity of sulphur and silicon delivered to the open hearth in hot metal materially affects furnace practice and performance. The currently higher level of sulphur in iron, which is also accompanied by higher sulphur in both scrap and fuel, results in higher sulphur steel. Efforts to alleviate that situation require the use of larger quantities of limestone in the open hearth charge and increased time of heat with consequent lower production. The additional lime forms a heavier than normal blanket of slag on the molten steel, which in turn reduces heat transfer and increases fuel consumption.

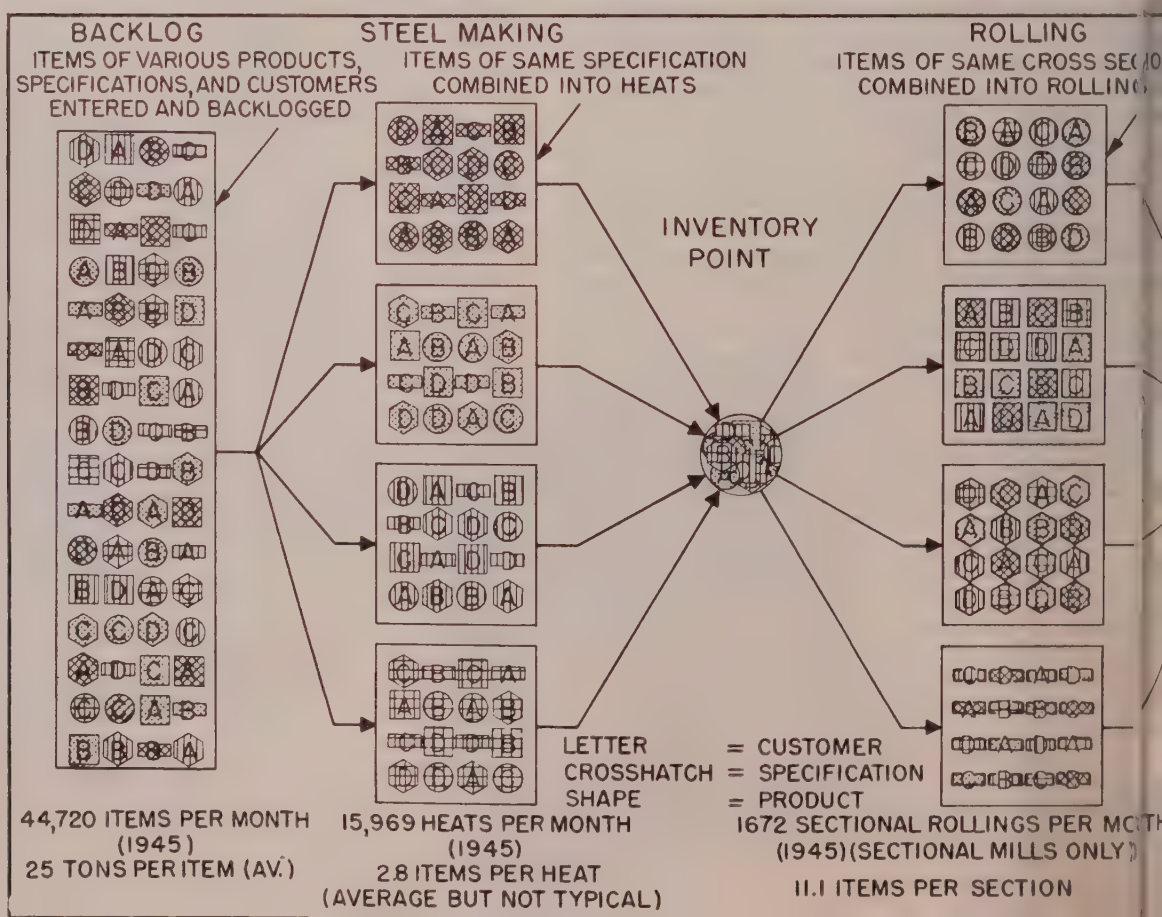
High silicon iron also requires the use of heavy limestone charges in the basic open hearth with resultant heavy slag volumes because it is necessary to balance the acid-forming silicon with lime to avoid damage to the refractories and to control the composition and quality of the finished steel.

Steelmaking processes now employed in the United States, and the proportion which each bears to total production of steel have been arrived at by many years of experience. It is not an accident that the basic open hearth process produces 90 per cent of our steel, the bessemer process 5 per cent and the electric furnace process 4½ per cent.

Those proportions were arrived at by an integration of factors involving raw material supply, assembly costs, processing costs and end-use requirements. In the long run it has been the consumer of steel in the United States who has determined the major process to be used.

What Is Quality?—It is frequently said that electric furnace steel is of the highest quality and that bessemer steel is the lowest. Such a statement contains no element of truth or logic. It is quite impossible to rate the quality of a kind and grade of steel without describing the use of which the steel is to be put. For some uses electric furnace steel is unquestionably the finest quality obtainable; in other applications, bessemer steel is superior to all others. In the wire industry, for example, there are a number of special-purpose wires for which no wholly satisfactory open hearth or electric furnace steel substitute for bessemer steel has been developed.

The word "quality" is most closely allied to performance requirements and only remotely related to chemical composition or tensile strength. There are factors inherent in the word "quality" as applied to steel which up to now have not been described or de-



fined by numerical values, or evaluated by any test except performance.

A kind of steel is generally described by the manufacturing process. A type of steel is generally described by a broad term such as carbon, alloy, stainless, tool steel or high strength steel, although some of those terms may have more than one meaning. A grade of steel may be described by chemical composition or mechanical properties; and the quality is described by end-use or general product description.

Production Variables—Several typical variables in the manufacture of steels which cannot be set forth in formal specification but which are, nevertheless, of prime importance are:

1. Careful selection of raw materials for melting, which may be different for each quality.
2. Steelmaking practices designed to produce the desired quality in each individual case.
3. Selective ingot or slab preparation.

A steel consumer always thinks solely in terms of quality, whether he recognizes it or not, because he always has a specific end use in mind for the steel which he purchases. A steel producer thinks in terms of making good steel based on a clear understanding of the consumer's end-use requirements. That may mean anything from the most exacting "aircraft quality" to "soft steel."

Production scheduling consists in blending a multiplicity of orders, customers' delivery requirements, men, material and equipment to obtain a result satisfactory to both customer and steelmaker. Because the basic production lot in steel manufacture—the heat of steel—is nearly always larger than individual orders, there is a constant building up and tearing down process in steelmaking and rolling mill schedules. A heat comprising many orders is put together, the steel is made, and then it is widely distributed to fill rolling schedules.

Fig. 1 illustrates the principles involved in mill scheduling. The items grouped under the heading "backlog" are illustrative of the raw material from which a schedule clerk works. The different shapes indicate the many products that the steelmaker rolls; the different letters represent the many customers; and the cross-hatching represents the numerous specifications which are ordered. From that assortment of items the schedule clerk combines like elements to fit the abilities of mill equipment and at the same time satisfy the demand of the many customers.

In steelmaking, items of the same crosshatching are combined, indicating a grouping of specifications to make heats. It is in this operation of steelmaking, above all others, that the benefits of standardization and simplification to both producer and consumer are apparent. From the steelmaking furnaces the product moves into inventory points where there is a certain amount of mixing of different products, different specifications and items for different customers.

In the rolling operation an entirely different combination has to be made. Items of the same product shape and size must be grouped together. Here again, standardization plays an important part in enhancing production. Without standard tolerances, for example, the problem of rolling steel would be impossible to solve.

Grouping material for shipment is more simple; it involves only collecting like items for each customer regardless of the product and specification involved.

Methods of Specifying Steel—The six most common methods of specifying steel are: (1) By product or commodity description, examples of which are wool wire, roofing sheets, baby carriage spring steel and boiler firebox plate; (2) by chemical composition and quality designation as by SAE, WD, AMS or AISI number; (3) by mechanical properties such as tensile strength; (4) by hardenability limits as typified by the standard H alloy steels; (5) by requesting the steel producer to furnish steel to make an identified part on the equipment and by fabricating methods available to the consumer; and (6) by formal specification such as ASTM, Federal Specifications Board or Navy specifications, which may contain two or more of the foregoing methods.

Each of those methods has distinct advantages to either the steel producer or the steel consumer; no one of them is completely fair to both. If the steel consumer has a well-rounded knowledge of steel manufacture and processing, and if the steel producer has an intimate knowledge of the consumer's plant and processes, then method (5) is most equitable to both parties.

Method of describing steel by end use or by com-

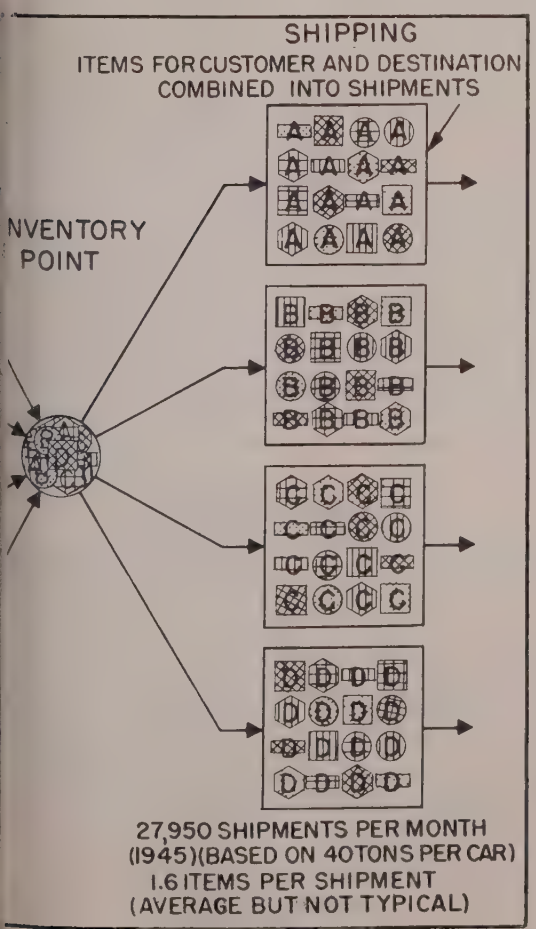


Fig. 1—Chart illustrating principles involved in mill scheduling

modity name is the oldest form of specification. In the early days of the modern steel industry in America, tonnage steels were made only in the bessemer converter and few grades of steel were made. Moreover, industry generally was not so complex as it is today.

It is easy to understand, then, why the term "soft" steel had a quite definite meaning to both producer and consumer. The term really meant "steel which can be bent and cut easily with hand tools and which can be shaped and welded easily at a blacksmith's forge." When the basic open hearth process of steelmaking came into use the term lost some of its significance because, for the same chemical composition, basic open hearth steel is softer than bessemer steel.

The terms "soft", "medium", and "machine steel" are used today, as are many other outmoded terms, but a steel mill will generally ask for information as to end use, or confirm the order in terms of the maximum carbon content it expects to furnish.

"End-Use" Specification—An example of "end-use" or commodity description which substitutes for a formal specification is that of deep drawing quality sheet steel.

To understand the difficulty involved in arriving at a satisfactory specification or description of deep drawing quality sheet steel requires an understanding of the variables inherent in the type of ingot required to produce that quality, and the variables involved in the user's fabrication of the sheet into stampings.

Technology of testing sheet steel and the evaluation of test results has not yet been developed to a point where the drawability of a lift of sheets can be predicted with a high degree of accuracy. Consequently, the only safe means of defining the quality seems to be in terms of expected performance in the fabrication of an identified item.

There is a good reason why drawability cannot be predicted with a high degree of accuracy when based on mechanical testing only. Property values of the sheets from an ingot of steel are distributed around a mean value, and the deviation from the mean determines the increase or decrease in per cent of breakage in an otherwise constant fabricating operation. To determine this mean with precision requires the testing of many sheets to be assured that any deviation from the mean is not due solely to chance in the selection of the sample. The sheets used for testing are destroyed and cannot be used to make the identified part; therefore, the test results cannot be directly verified by actual performance.

Fig. 2—Off-heat expectancy for manganese. Maximum of specified manganese range 1.01 *to* 1.30 *per cent ladle analysis*

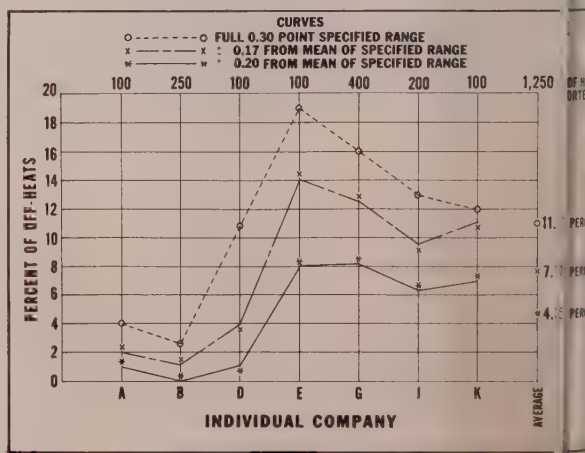
To get around that difficulty, the mill metallurgist learns by experience what limit of drawability can be expected from a fundamental steel quality processed under controlled conditions. In terms of a specific draw, the metallurgist prescribes the conditions of control, and the tests performed on a limited number of samples will then tell him if a lot is statistically similar to previous lots made from similar material and processed in the same manner, and on which drawing results are known. With this background the metallurgist can predict with a fair degree of assurance, the expected performance of a given lot of material.

As so many variables enter into the manufacture and utilization of sheets in stampings of specific design, the obvious definition should be in terms of performance and not in specific processing for individual parts.

Automotive Industry and Steel Grades—It is interesting to speculate upon the growth and development of the automotive industry as it is related to steel grades and to steel qualities. Much attention has always been given in the literature to a certain few types, grades and qualities of steel of limited tonnage application. Great strides have been made in utilizing those steels, and I hasten to give credit to the engineers and metallurgists of the automotive industry for leading the way in their development. Those steels are very interesting to technical men because of the wide variations in microstructure and wide ranges of mechanical properties which can be secured with various heat treatment cycles. They are interesting, too, to the layman because of the sonorous and glamorous names which they bear.

But, in respect of a very much larger tonnage of steel, the automotive industry has until recently, been content to present a design and challenge the steel producer to make steels which will behave properly and economically in fabrication and service. That the steel industry has performed successfully is attested by the success of the consumers' product. It is, therefore, difficult to reconcile technically the present great interest specificationwise in restrictive requirements which embrace chemical composition, mechanical properties, fabricating requirements and end-use requirements in the face of the history of the relationships between steel and automobiles.

Many times the steelmaker is put to a great deal of trouble and unnecessary cost to meet a requirement



which is technically and economically unsound, even for the consumer.

Chemical Composition — The second method of ordering steel is by chemical composition limits and quality designation. Although this method is much discussed, and there is probably more information in the literature of steel relative to it than about any other method, only 22 per cent[3] of the steel manufactured is ordered to chemistry. Indeed, it would appear from available records that only one-third of the steel purchased by the automotive industry, the arch-exponent of chemical specifications, is ordered by that method.

Chemical specification was a device by which the steel consumer hoped to secure uniform results from heat after heat of steel the compositions of which fall within the same specified chemical limits. It was thought that close chemical identity would give identical or at least almost identical results in fabrication, heat treatment or performance, or all three.

At the time that idea was rising to a dominant peak in technical thinking, little was known about the effects of ingot size, special deoxidation practices, incidental elements and many other such factors which materially influence the behavior of steel in use. Qualitative effect of some alloying elements in substantial amounts was known but little was understood in a quantitative way, particularly about the interrelationships of one alloying element with another, or the relationships which existed among the several alloying elements in use.

But descriptive information continued to be published relative to the different grades of steel and their dominant alloying elements and the simplicity of much of it enhanced the chemical composition method of specifying steel. A consumer who had learned that carbon was a hardener, that nickel was a toughener and that copper checked atmospheric corrosion was led to believe that he could look at chemical specification limits and tell how the steel would behave. And for a long time he was quite successful.

As some of the more important physical characteristics of steels made from simple chemical combinations changed, without any corresponding change in published chemical specification limits, the problem of describing steels was made more difficult. The concept which grew during this period that all steels are the same, except for chemical composition is, of course, false and misleading. Fundamentally, it is a fact that carbon steels may be produced within the specified chemical limits of a given grade and still have characteristics that are widely dissimilar.

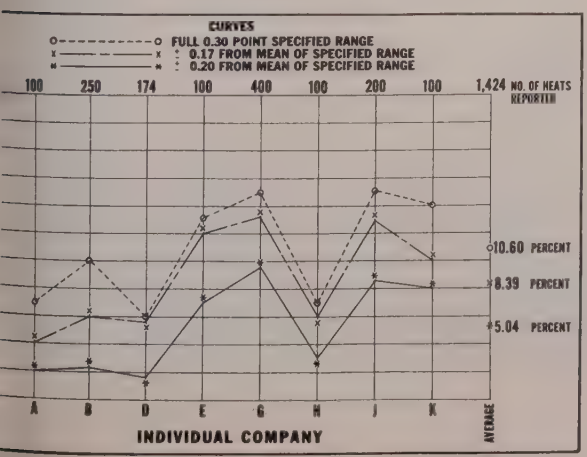


Fig. 3—Off-heat expectancy for manganese. Maximum of specified manganese 1.31 *to* 1.65 *per cent ladle analysis*

Technically, steel quality as the term relates to bar products may be indicative of many conditions, such as the degree of internal soundness, relative uniformity of chemical composition or relative freedom from injurious surface imperfections. Steel quality also relates to general suitability for particular purposes or end-uses. There are two fundamental quality classifications in this category, namely, merchant bar quality, and special bar quality.

Hot rolled carbon steel bars should be specified as special bar quality or an additional restricted requirement variation thereof, for purposes for which merchant bar quality would not be suitable or which may be subject to requirements governing chemical composition, mechanical properties, workmanship, or finish more restrictive than would constitute merchant bar quality.

Standard Steels—The greater portion of the tonnage of carbon and alloy steel bars and semifinished products, and carbon steel wire rods and wire are now specified to the SAE-AISI list of standard steels. Prior to the studies which resulted in standard steels there were thousands of steel compositions in use, many of them varying from one another in respect to the chemical composition by amounts so small as to have no metallurgical or engineering significance.

A standard steel as presently defined is a steel composition which is produced in the significant amount of one-quarter of 1 per cent of the total tonnage of the product in which that steel is normally used. That figure was originally adopted because it was felt that a tonnage of that order was the lowest which would permit of frequent manufacture with consequent improved steelmaking and rolling practices; on the other hand, a higher figure might be unfair to the steel consumer.

The bogey, or significant amount necessary to qualify a steel as a standard steel for 1948 is 14,000 tons for carbon steel bars; 9000 tons for carbon steel semifinished products; 2500 tons for wire rods; and 3800 tons for alloy steel bars.

From the foregoing it might be assumed that all work in connection with standard steels is done without benefit of consultation with individual consumers. Such is not the case. Of course, the order books of steel companies reflect accurately the grades and tonnages of steel being ordered and so our studies, of necessity, are of a high order of exactness. But every now and then a slip-up occurs. In such cases the consumer requests a check and such a check is made promptly, and on a large scale. If sufficient tonnage is found within the industry, the Institute's General Technical Committee will recommend to the Committee on Manufacturing Problems addition of the steel to the standard list. If sufficient tonnage is not found, the consumer is so advised.

Removing a steel from the standard list is not so

How Steel Producers View

STEEL COMPOSITIONS AND SPECIFICATIONS

simple, however. Before a steel can be removed it must fail to meet the one-quarter of 1 per cent requirement in two consecutive surveys. Such precaution is necessary to avoid dropping from the list of tonnage steel used by an industry which may be temporarily operating at a low rate because of seasonal or cyclical variations, raw material shortages, labor difficulties, or any other such cause.

Mechanical Properties—There are many uses for steel in which the only properties of real significance are strength and ductility, and so specifications are written which stipulate values for such variables as tensile strength, yield point, reduction of area, elongation, bend tests, drift tests and crushing tests. That type of specification has never become popular in the United States except for products such as plates and structural shapes.

Even for those products, the customer must be careful to specify limits which can be met in the thickness of material desired. For example, if carbon steel plates are required in the as-rolled condition within a tensile strength range of 55,000 to 65,000 pounds per square inch, the relationship between thickness and carbon content (assuming semikilled steel and manganese in the range of 0.40 to 0.60 per cent) is approximately as shown in Table II.[4]

Sensitivity of steel sheets rolled on a continuous mill to variations in carbon content and thickness, expressed as tensile strength, is shown in Table III.[6]

Cooling rate of steel is a function of the thickness and size and in this case it is evident that some air-hardening has occurred coupled with a lower than normal finishing temperature. In a case of this sort, the presence of incidental alloying elements can have a more marked effect than in the case of thicker material.

Specifying both chemical composition ranges and limits and mechanical property values is inadvisable from any other points of view. The greatest difficulty experienced in devising such a specification lies in keeping the provisions of the specification homogeneous for the product involved. All too frequently the chemical composition desired is technically incompatible with the desired mechanical properties. Chemical hardness is sometimes specified which is inconsistent with mechanical ductility; and sometimes strength-yield point ratios are specified which are impossible of attainment with the specified chemistry, shape and section size.

End-Use Should Be Made Known—If only chemical limits and mechanical property values are specified, any inconsistencies are usually caught by the steelmaker before the order is placed for production. But there is a growing tendency on the part of steel consumers to keep in the background a fabricating requirement or an end-use requirement. More often than not those requirements are far more important than chemical composition or mechanical properties.

TABLE I
IRON AND SILICA CONTENTS OF TYPICAL BLAST FURNACE ORES

	Fe, %	SiO_2, %
1943	51.80	7.73
1944	51.51	7.79
1945	51.41	8.30
1946	51.38	8.45
1947	51.12	8.77
1948	50.42	8.92

In most drawing jobs, for example, the parts are used mostly for covering purposes in which they bear only nominal stresses and no particular chemical composition, mechanical properties, or end-use characteristics of the component are required. The most important requirement of the steel is that it act satisfactorily in fabrication both technically and economically. In spite of that there are those who would like to tie the steel manufacturer down to four sets of specified conditions: Chemical composition, mechanical properties, fabricating requirements and end-use requirements.

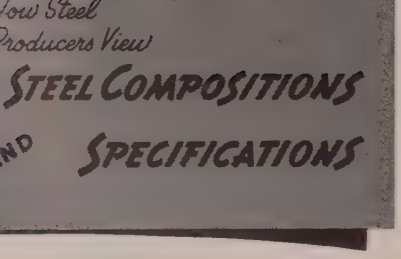
Logically, the four are not necessarily related, and up to now no one has been able practically to measure the individual values and correlate all the results even in those cases in which a relationship between two or more of the four factors is known to exist.

With the development of mass heat treatment procedures and induction hardening the demand arose for steels having closer chemical ranges than ever before. As a matter of fact, the ranges desired were closer than could be manufactured economically and sometimes closer than were really necessary to do a intended job. Added to that, many consumers required certain balances, specifying that when carbon was on the high side of the range, manganese should be on the low, or that carbon plus manganese should not exceed a certain maximum or minimum. Such specifications were met only at exorbitant cost to the steel producer and economic loss to the country at large. Even then, the results desired were not wholly achieved because the specification method did not embrace the other factors which affect the fundamentals of fabricating and heat treatment processes.

Off-Heats Studied—A study recently made by the Institute's Technical Committee on Carbon Steel Bars and Semifinished Products of off-heats attributable to manganese in carbon steels clearly supports the foregoing position. It also shows the conditions faced by steel manufacturers in meeting presently established specification ranges and explains the primary reason for rather frequent requests to apply material slightly outside the specified manganese range.

Fig. 2 presents statistics compiled on 1250 heats made by eight steel producers. Maximum of the specified range for manganese of all those heats was between 1.01 and 1.30 per cent. With the present range of 30 points (0.30 per cent) there was an average off-heat performance of 11.1 per cent. If the range were increased to 34 points (0.34 per cent) off-heat expectancy would still be high, 7.71 per cent.

A similar study, Fig. 3, made on 1424 heats



carbon steel having the maximum of specified manganese ranges between 1.31 and 1.65 per cent showed similar results. With a 30-point range the off-heat performance was 10.6 per cent. If the range were increased to 34 points, that is, 17 points over and under the specified mean, the off-heat expectancy would be 8.39 per cent.

Increasing the manganese range to 40 points would bring the off-heat expectancy for the lower manganese grades to 4.54 per cent and in the higher grade to 5.04 per cent. While the data clearly indicate the need for a 40-point range in manganese, the firmly established traditional range of 30 points is still maintained. It is to be noted, however, that even a 40 point range is not the entire solution to the problem because off-heats in the ranges of manganese studied pose difficult problems of disposal. In many instances the high manganese is accompanied by high specified sulphur so the material is not readily divertable, and, when rejected, is not even desirable scrap.

Hardenability Limits—Ordinary chemical composition tells us little about steel because it does not tell us how the elements are arranged structurally. Samples properly taken from the same bar, one annealed and the other heat-treated to high strength, will exhibit the same chemical composition within the limits of analytical error. The differences in the physical structure of the steel, which are marked, can be observed by the microscope or by a hardness test.

Because the microstructure of steel and the attendant hardness value correlate well with service performance, the standard end quench test was developed to utilize hardness and the concomitant structure, as a means of attempting to predict the hardening properties of alloy steel prior to actual use, and as a production control test for checking steel to be heat treated.

That test has resulted in the establishment of the so-called H-band specifications for alloy steels. Important as those specifications are in peacetime to large consumers of alloy steels, they will become doubly important in case of war because they make possible intelligent and effective conservation of alloying elements. The bulk of our alloying elements is secured from distant foreign sources and in such quantities that they must be water-borne.

Some attention has also been given to the possible development of hardenability bands for carbon steel compositions. Results to date have not been encouraging because of the normal shallow hardening characteristics of carbon steels for which the standard end-quench hardenability test is unsuited.

Formal Specification—Frequently, the formal specification is used by the consumer of steel as an ultimatum to the producer; and because no specification can ever eliminate human errors and foibles the producer must counter with a formal statement designed to distinguish between civil and criminal liability when an error of one kind or another makes its appearance.[5]

TABLE II

RELATIONSHIP BETWEEN THICKNESS AND CARBON CONTENT OF PLATES WITHIN A T.S. RANGE OF 55,000 TO 65,000 PSI

Plate thickness, in.	Carbon content of finished plate, Per cent
¼	0.16/0.18
1	0.22/0.25
2	0.25/0.28

TABLE III

SENSITIVITY OF SHEETS TO VARIATIONS IN CARBON CONTENT AND THICKNESS, EXPRESSED AS TENSILE STRENGTH

Thickness, in.	Carbon Content, per cent		
	0.10	0.20	0.30
0.100	53,000	64,000	80,000
0.250	48,000	53,000	62,000

Formal specifications generally cover such details as method of manufacture, chemical composition, mechanical property values, tolerances and methods of testing. All provisions of the specification are supposed to be consistent and ordering steel to meet a given recognized specification would seem to ensure securing steel to do a given job.

But that is true only if the scope clause of the specification adequately sets forth the proposed end use of the steel that the specification is supposed to cover. A poor scope clause means a poor specification. A strong scope clause can save an otherwise poor specification because it puts the responsibility for performance of the steel on the steel producer if he accepts the specification in its entirety.

Steel product specifications of the American Society for Testing Materials are accepted generally as standards in the steel industry. They are realistic specifications and most of them have proved their worth for many years. Many of the most important buildings, bridges, power plants and railroads in the United States are monuments to their technical and economic excellence.

Previously, three variables of major importance in steel manufacture which affect quality and which are not set forth in specifications, were enumerated. The first was "careful selection of raw materials for melting." The second variable, "steelmaking practices designed to produce the desired qualities in each individual case," is more complicated and more elusive. Third variable, "selective ingot or slab preparation" requires that some qualities of steel be hot-topped while others must be capped or rimmed. A relationship exists between mold size, mold design and quality of product.

All those and many more mill procedures grounded in long experience are employed to make the quality of steel to do the job demanded of it.

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MOORE JIG BORER built with MEEHANITE® CASTINGS for...

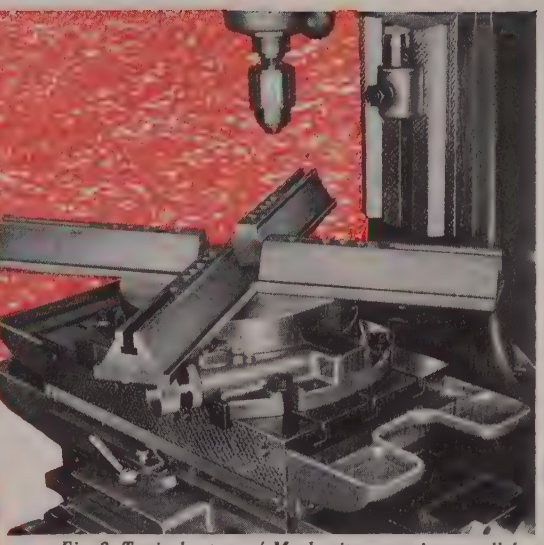

Fig. 2. Typical set-up of Meehanite extension parallels.

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"Uniform Grain"

"High Strength"

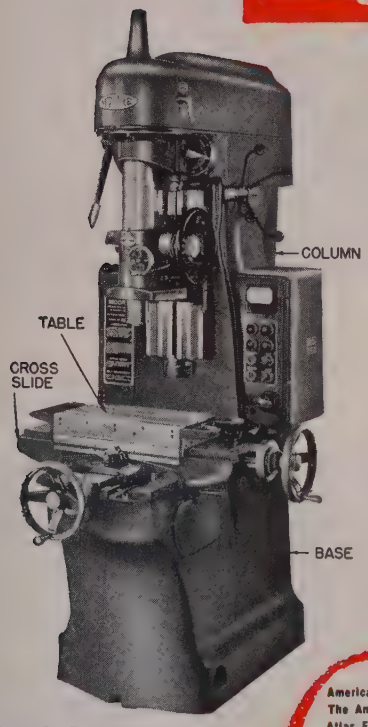

Fig. 1. Important Meehanite castings used in the construction of the Moore No. 2 Jig Borer.

The precision jig borer illustrated (Fig. 1), manufactured by the Moore Special Tool Co., Inc., Bridgeport, Connecticut, uses Meehanite castings extensively because of their contribution to the quality, accuracy and precision operation of this machine tool.

The important castings indicated are, according to the chief engineer of the company, specified as Meehanite castings for the following reasons:

1. "Close control of hardness for maximum wear resistance, yet just within the range of hand scraping."
2. "Uniform close grain for good machinability and absence of blow holes."
3. "High tensile strength and resistance to deflection."

In addition a number of fixtures similar to the extension parallels (Fig. 2) are Meehanite castings for similar reasons.

Complete machining data for various types of Meehanite castings is tabulated and illustrated in our new Bulletin No. 29 "How to Machine Meehanite Castings." For a copy write to any of the foundries listed.

MEEHANITE FOUNDRIES

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington, New Jersey
E. Long Ltd.	Orillia, Ontario
E. W. Bliss Co.	Hastings, Mich. and Toledo, O.
H. W. Butterworth & Sons Co.	Bethayres, Pennsylvania
Continental Gin Co.	Birmingham, Alabama
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co.	Portland, Oregon
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
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Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
The Henry Perkins Co.	Bridgewater, Massachusetts
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kanawha Manufacturing Co.	Charleston, West Virginia
Koehring Co.	Milwaukee, Wisconsin
Lincoln Foundry Corp.	Los Angeles, California
Otis-Fensom Elevator Co., Ltd.	Hamilton, Ontario
Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Sonith Industries, Inc.	Indianapolis, Ind.
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
U. S. Challenge Co.	Centerville, Iowa and Batavia, Illinois
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SCIENTIFIC STOREKEEPING

. . . insures rapid movement of diesel locomotive items from new replacement parts center

TO meet the increasing demand for replacement parts, a new diesel locomotive parts center is now in full operation at General Motors' Electro-Motive Division, La Grange, Ill. From the new center, parts will flow to six other strategically-located distribution points across the nation, as well as to fill consumer requirements directly.

Complete streamlining has been effected in the new parts center structure which is situated adjacent to the main production facilities. Latest developments in industrial construction provide 155,000 square feet of floor space, glass walls, complete forced air heating and ventilating, also air conditioned offices. Office space occupies the entire front of the building. A 30-foot high loading section extending along the west end, and the balance of the area for storage and operating purposes complete the three major sections.

This streamlining starts in the front office where all orders are received. A bank of the latest type accounting machines prepares orders in a matter of minutes ready for processing. Pneumatic tubes whisk orders from the machines to the clerk's headquarters in the adjoining warehouse section for filling.

Surrounding the warehouse terminal of the tube is a broad expanse of small parts bins capable of housing more than 20,000 items. All are labeled with part numbers and location designations. Orders are picked from these steel bins and transferred to a mechanized conveyor belt which moves the finished cartons to the consolidating section for shipment. Broad aisles for the convenient use of lift-trucks permit storage and rapid movement of larger parts by the pallet method. In fact, precartoned parts are handled almost entirely on the pallets which permit high piling cartons.

Steel bins capable of storing more than 20,000 items are located next to the mechanized shipping line for rapid movement of orders

Engineered packaging and box making are also specialties in the new center. Parts are inspected and packed in specially-designed cartons. These range in size from those as small as a postage stamp to the larger ones which house a complete generator rewind kit of 2861 pieces. Much research is constantly devoted to packaging and shipping. Protection to the part, while in storage and in transit, protection against the elements, ease of stacking, and economy in unpacking time for the customer are "musts" in container design.

After much research in industrial plants, the division has standardized upon a location method of storekeeping throughout the entire operation. Parts locations are recorded on cards maintained in a central card file so that order clerks and parts pickers have the exact location of any part at their finger tips. Many more parts stored in a given space are a result of this method. Stock shifting becomes a matter of paper work instead of the transfer of heavy pieces when the location system is employed.

To provide easy handling of shipments, a rail spur which accommodates the loading and unloading of five box cars at one time, is built into the loading dock. Loading platforms are at box-car floor level. An electrically operated overhead crane capable of moving heavy assemblies, like complete motors or generators, feeds shipments both in and out of the cars. Loading docks to accommodate highway trucks are likewise inbuilt to afford further protection to material and workers alike.

"Tool Control" Plan Instituted

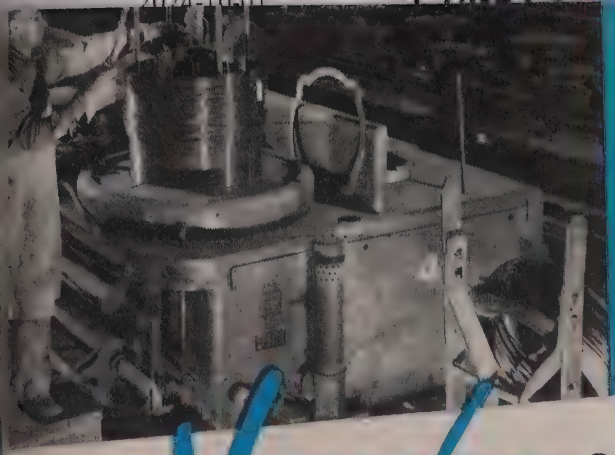
Being made available to manufacturers in the metalworking industries is a comprehensive and co-ordinated tool control plan, designed to help achieve lower costs and developed as a result of several years of research and fact finding by Carboloy Co. Inc., Detroit. It is stated that with the use of more effective tool control, lower break-even points through major reduction in manufacturing costs may be obtained without requiring any expenditures for capital equipment.

Carboloy states that, in general, the program of tool control is of such a nature that it can be applied by the individual manufacturers themselves. To make this possible the company has developed and is making available a number of aids, including: A manual of tested cost-reducing tool-control systems and practices, with actual examples of their application in different types of metalworking industries; a training course, including six slide films, also reproduced in book form, for in-plant training of personnel; a 200 page tool manual dealing with technical phases of tooling.

Field organization of the company is being made available as a consulting organization trained to help manufacturers put the plan into operation. / It is stated that while the company is primarily interested in carbide tools, the savings possible by reducing manufacturing costs through tool control apply regardless of the type of cutting tools used.

—o—

A 17-page bibliography on x-ray stress analysis, compiled by Herbert R. Isenburger, is available from St. John X-Ray Laboratory, Califon, N. J., for $3.00. It has a total of 240 individual listings and has a subject index which facilitates its use.



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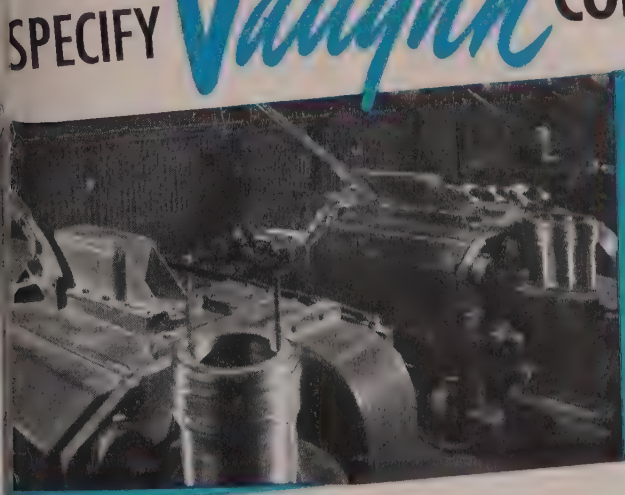

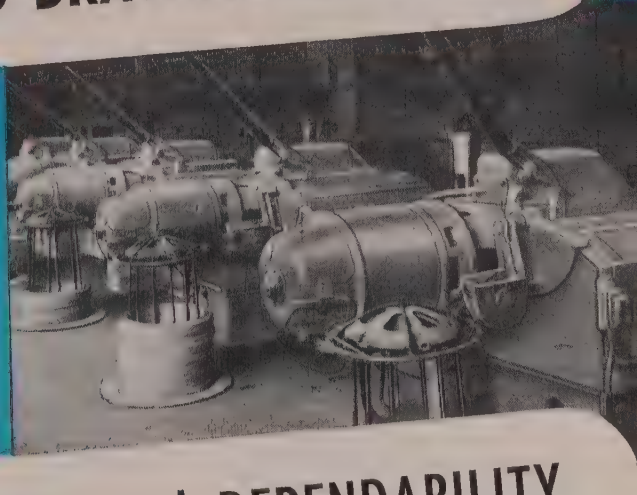

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Operation of

STATISTICAL QUALITY CONTROL

In a Steel Mill

The author discusses the operation of a program of this type. Statistical methods used are described with an illustration of each presented to explain the application

By W. T. ROGERS
Metallurgical Statistician
National Tube Co.
Lorain Works
Lorain, O.

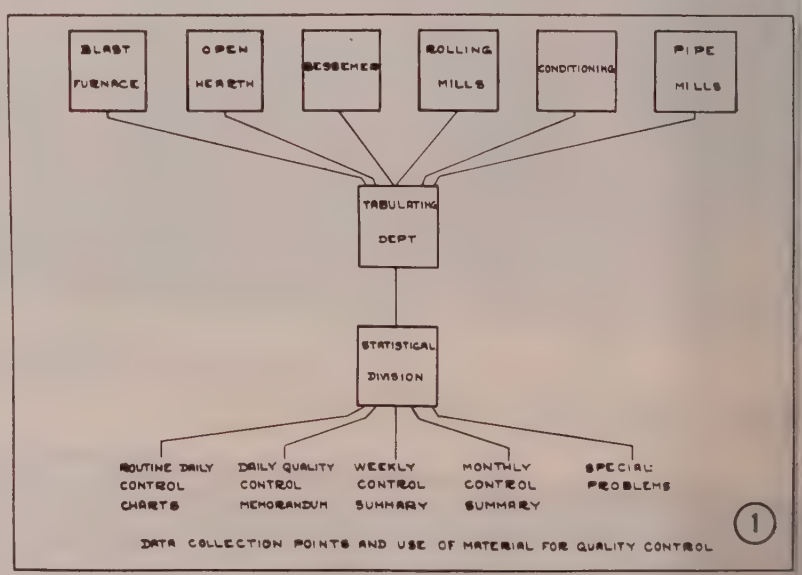
IT is not to be expected that application of quality control in a large steel plant will be the same as that ordinarily applied in smaller more highly specialized industry. Quality control is generally thought of as dealing entirely with sampling procedures which present and solve risks involved in accepting and rejecting material. In a large, self-contained industry dealing with large units such as a 150-ton open hearth heat of steel, which is made far in advance of its ultimate fabrication, the place and importance of statistical quality control is of a different nature than the setting up of acceptance and rejection standards on inspection procedures. The problem in this application environment is to determine what makes a good or bad heat and to so control processes and raw material that the highest percentage of heats will be obtained which will produce satisfactory quality results at the final inspection table. It is therefore necessary that something be known about variables which will affect the processing of a heat into semifinished and finished products.

For this reason the problems encountered are mainly those of correlation analysis. Historical experience must be analyzed to determine factors which are likely to be detrimental or beneficial to the processes. Those factors which are found critical are then followed by the control chart method. Use of new materials and methods are constantly being advocated and in order to avoid costly long term trials or practices which are not beneficial and to accept those which show improved results as soon as possible, statistical significance tests are necessary. Sample inspection is not generally applied in the steel plant although its use is put to advantage in some testing processes.

It is evident then that a quality control engineer or statistician in a large plant must be a specialist in the many statistical methods which can be applied to the various problems confronting him. It is believed that with this viewpoint in mind, it will be of interest to bring out methods of collecting and analyzing information, processing it through a statistical quality control department, and disseminating the results to managerial and operating personnel.

Records which must be analyzed in order to properly evaluate the many problems encountered in a modern steel mill are voluminous. It is therefore necessary to say something about data collection which the quality control division must analyze in order to aid the operating departments in solving their problems. A metallurgical quality control group depends for its information on routine operating and production reports, metallurgical observations, chemical analysis of materials and final inspection reports as submitted by the inspection department.

Graphically, Fig. 1 presents a chart showing orgination of the data, its processing through the tabulating department, the statistical division of the metallurgical department and on its final routine use. It will be seen that material is collected from nearly every source from which variables related to quality are likely to be found. Blast furnace chemical records show composition of the iron, and open hearth charging, working, finishing and pouring operations are the source of quality related variables at this point. At the



Paper presented before Pittsburgh chapter of American Society for Quality Control, Feb. 3, 1949.

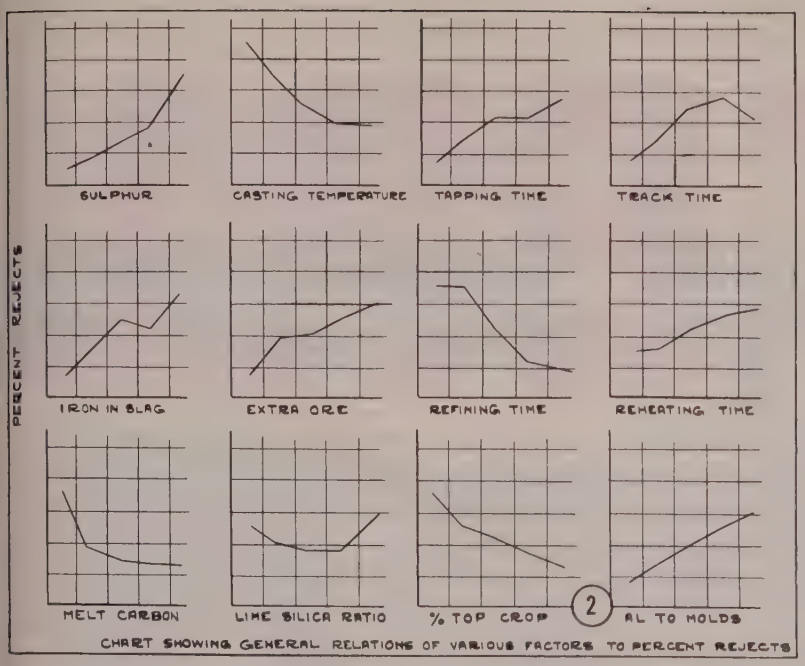


CHART SHOWING GENERAL RELATIONS OF VARIOUS FACTORS TO PERCENT REJECTS

bessemer plant such variables as blowing time, iron analysis, and teeming practice, furnish measures of quality, related to bessemer products.

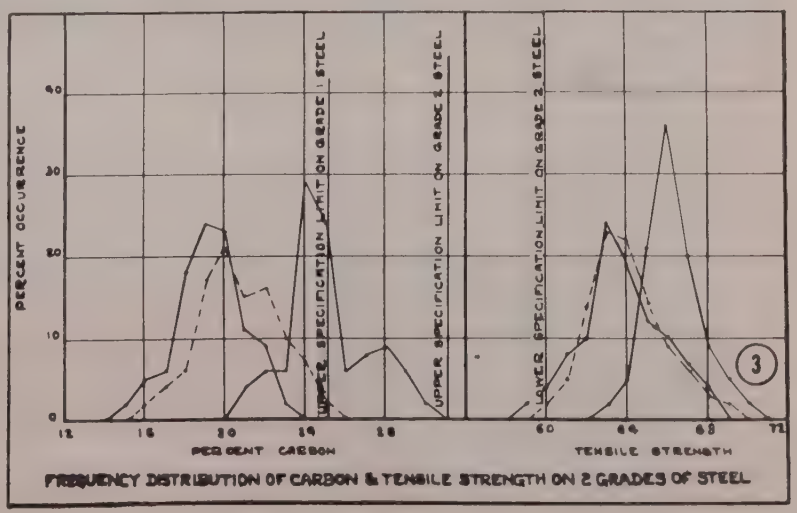
In rolling mills information is obtained relative to heating, rolling and shearing practice. At the semifinished or conditioning department, the first factual information relative to the steel quality is available, which is the surface condition, amount and depth of pipe cavities and dimensional measurements which must be met, before the steel can be moved to the next processing point. The finishing mill, in this case, the pipe mill, furnished the final answer to steel quality. Here final inspection results are obtained and here it is learned whether a heat which will satisfactorily meet the customer's requirements has been made and whether or not it has been made as economically as possible with respect to its quality. Data are collected from these various sources daily, forwarded to the tabulating department which punches quality control information desired on tabulating cards, processes these cards into routine daily reports containing information relative to the department from which the information came.

From this daily collection of material, data obtained are used for the maintenance of ninety control charts of variables which have been found to be related to quality. A master set of these charts pertaining to all departments is kept by the metallurgical quality control division. Duplicate charts pertaining to the department from which the data originate are also maintained by the particular operating department's own personnel. In this manner quality related factors which get out of control are pointed out daily to the department head concerned. Some factors which have been found related to quality for tubular products are shown in Fig. 2. These graphs indicate a number of the relations which are generally found to hold true and for which it is necessary to maintain control charts.

Examination of these charts shows that the relations found are of many types with respect to magnitude and shape and that linear relations are the exception rather than the rule. Secondly, a daily quality control memorandum is issued to the general superintendent's office with copies to the various department heads on which are indicated those factors which were out of control in the preceding 24 hour period. Supplementing this is a weekly summary presented to the operating departments showing status of the most important of these variables for the preceding week. A repetition of this procedure is also carried out on a monthly basis. In this manner management is informed of individual instances of lack of control, periodic lack of control and persistent long time trends. The foregoing explanation points out routine processes of a quality control program. In addition to this there are special problems requiring application of various statistical techniques ranging from simple applications of the frequency distribution to more complicated problems of multiple correlation. These will be cited briefly with a practical example shown in each case.

Frequency distributions are not generally used in solving metallurgical and quality control problems. There are, however, times when the problem requires no more than this simple technique to answer the desired question.

Illustrating this is the situation where two grades of steel with overlapping chemical and physical specifications were being produced individually. Problems of ordering and storage facilities made it desirable to combine these specifications and produce one grade of steel which would satisfy either specification requirement. Fig. 3 shows frequency distributions of carbon and tensile strength of the two grades of steel involved. It will be noted from this figure that while distributions of carbon overlap somewhat, the modes are quite far apart. This is not true, however, of the distribution of tensile strength, where it is shown that



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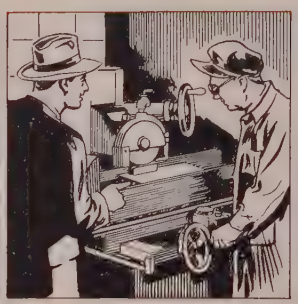

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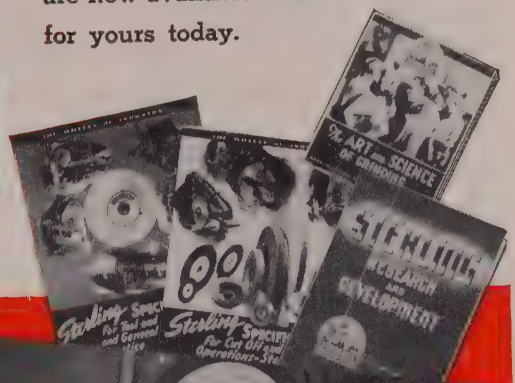

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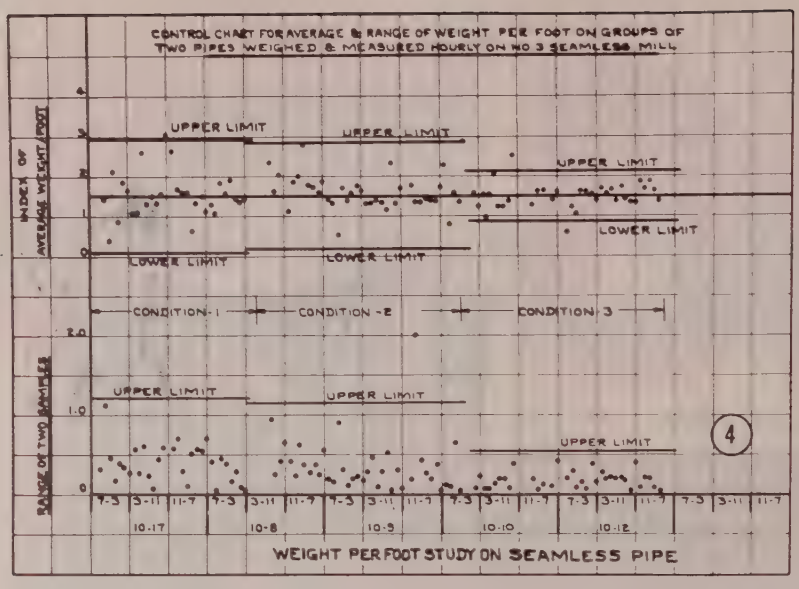
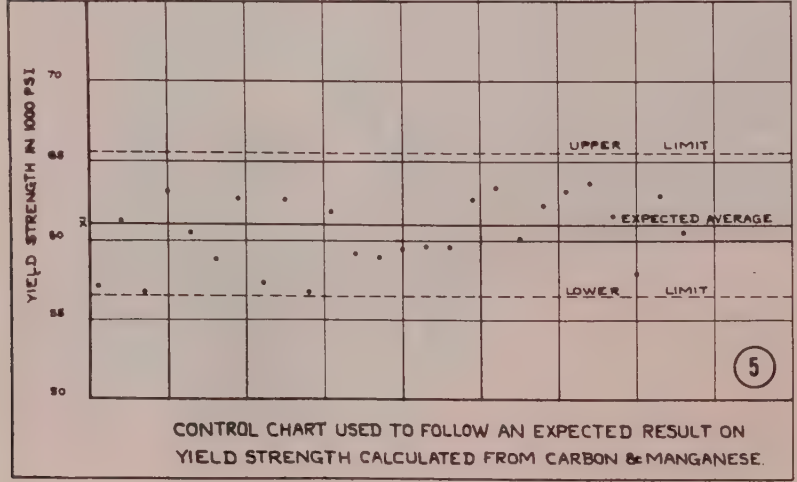


values overlap considerably and that the lowest value encountered on the grade requiring higher strength is only 4000 pounds in excess of the lowest value encountered on the grade with the lower tensile strength requirement. Minimum value allowed by specification on the high tensile strength material is 60,000 pounds per square inch and the lowest value encountered on the lower strength material is 59,000 pounds per square inch. It is evident from these comparisons that by slightly increasing carbon on the lower tensile strength material will make it conform to the steel with the higher requirement and also the higher strength material can have a lower carbon and still meet its tensile specification. Carbon content of the lower tensile material was shifted two points upward and that on the higher tensile material lowered four points, with results as shown by the dotted frequency distribution, indicating that combining the chemistry afforded a material which met both specifications without difficulty.

The control chart is another tool which can be used for evaluating results of an experiment. On a seamless pipe mill control of the weight per foot of pipe produced is essential and experiments with various rolling conditions in order to reduce the variability of this factor are quite common. In the example used to illustrate this application there are three different rolling conditions used on a seamless rolling mill and the problem is to determine which condition gives least variability in weight per foot. Fig. 4 shows a control chart of results of this experiment. Each condition was instituted on the mill and ran continuously for a certain period of time, and results with respect to weight per foot were recorded in chronological order as material was produced. It will be noted from this chart that differences result from the three conditions, that between conditions 1 and 2 being relatively insignificant, but 3 by its decreased variability, as shown both by average and range charts, represents a definite improvement over conditions 1 and 2.

Control charts have a further application in showing whether or not anticipated results are being obtained. An equation evaluating effect of carbon and manganese on yield strength of seamless line pipe has been developed by the statistical department. Data from which the equation was developed included a carbon range from 0.20 to 0.30 per cent and a manganese range from 0.30 to 1.00 per cent. However, orders received after this equation was developed required higher yield strength than could be obtained with the maximum combinations of carbon and manganese used. It was necessary therefore to extrapolate data beyond the original parameters. Danger in so applying an equation is well known and it was necessary to follow results closely and to know as quickly as possible whether or not the extension of this equation was correct. Methods used for following results was a control chart of groups of four tests taken chronologically as results were obtained. This chart is shown in Fig. 5 where it can be seen that the first point fell well below the anticipated average, the next point only slightly above average and the third was again low, indicating on the basis of the first values that extrapolation of the equation was incorrect and too much of an increase from either carbon or manganese was being expected. It is apparent, however, that neither of these low values were outside expected control limits and on this basis it was decided to continue with the same carbon, manganese range. Subsequent developments as shown by the balance of the control chart, prove this to have been a correct decision.



Applications of the "t" test are also valuable in a quality control department. It was desired to determine effectiveness of various blocking practices on a certain grade of open-hearth steel. Among factors to be evaluated were average manganese efficiency and variability of final manganese obtained in the steel. Table I shows various average manganese efficiencies obtained together with the number of heats under each practice and standard deviations. It is apparent from this table that some confusion will be felt in evaluating the difference shown. With the use

of the "t" test however, this indecisiveness can be resolved to simple probability. Values of "t"[1] as shown in the table can readily be transferred into relative chances. It can be seen that the no block manganese in furnace practice has only one chance in 450 of coming from the same universe as standard practice using 2300 pounds of 10 per cent Fe Si. The 2000 pounds of spiegel practice has only one chance in 265 of being as good and so can readily be rejected. The 750 pounds of 50 per cent Fe Si block evaluates at one chance in 145 of not being better. Eliminating guess work in this manner, it is determined that no block manganese in the furnace and 2000 pounds of spiegel give a lower efficiency while 750 pounds of 50 per cent Fe Si gives an increase in efficiency. Other practices show no significance on the basis of number of heats involved.

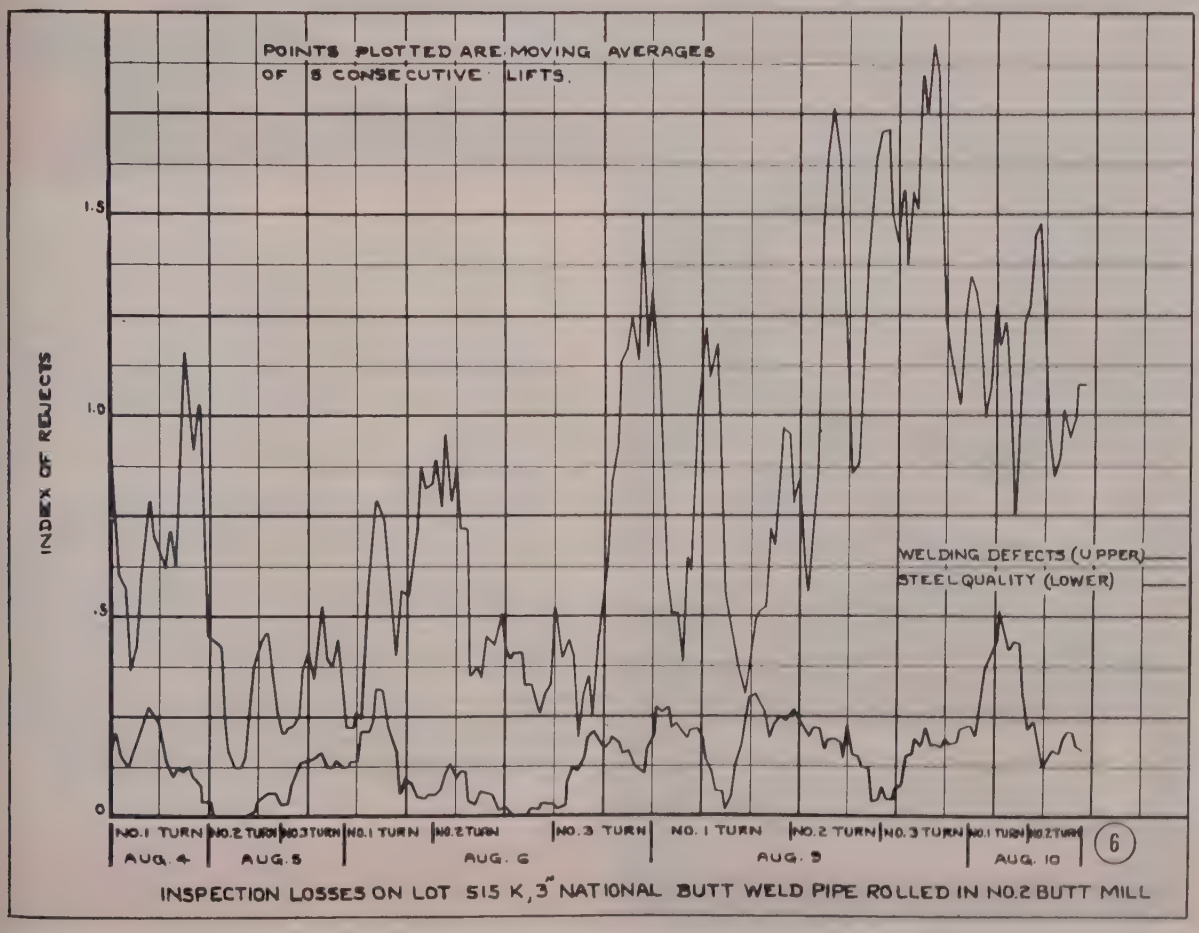
$$\text{"t"} = \frac{\text{x For Standard Block} - \text{x For Compared Block}}{\sigma \text{ For Standard Block} \div \sqrt{N} \text{ for Compared Block}}$$

Table II shows the method of applying the "t" test in making a decision as to differences in variability of final manganese content. Resolving these differences into values of "t"[2] also takes the guess work out of deciding which practice results in the least variability in final manganese analyses.

$$\text{"t"} = \frac{\sigma \text{ For Standard Block} - \sigma \text{ For Compared Block}}{\sigma \text{ For Standard Block} \div \sqrt{2N} \text{ for Compared Block}}$$

Another test of significance which has wide application is analysis of variance. The problem chosen to represent this application is one involving two methods of pickling pipe before galvanizing. Methods compared are pickling process without bath agitation and one with agitation. Test details are irrelevant in this discussion, however it consisted of 24, ten-inch lengths of pipe cut from each of several long lengths. Equal numbers of these short lengths were then pickled in the two manners prescribed, with results for the length of pickling time as shown in Table III. It is evident from a study of this tabulation that it would be difficult to determine the independent effect of each method due to the fact that there are inconsistencies within each pipe, from pipe to pipe and from one test group to another. A factual decision can be made in this case with the application of analysis of variance to determine significance of the observed differences. Results of this analysis is presented in Table IV where it is shown that the F value as calculated from the data is 60.5 for the difference between agitation and no agitation whereas the value at the 5 per cent level of significance is 5.1 and at the 1 per cent level is only 10.6. These comparative results remove any doubt as to significance of the difference shown even though there is also a significant difference between individual pipe selected for the test.

Moving averages also have their place in evaluating problems in a steel plant. On one run of buttweld pipe it was contended that high rejects for welding defects were being obtained because of steel quality. Inspection results were classified in such a manner that steel quality defects could be definitely determined. It was therefore a simple method of approach to make a chronological plot of the defects as they were manufactured on the mill, showing associated occurences of both quality defects and welding defects. Plotting



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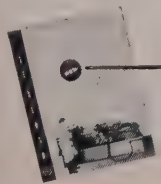

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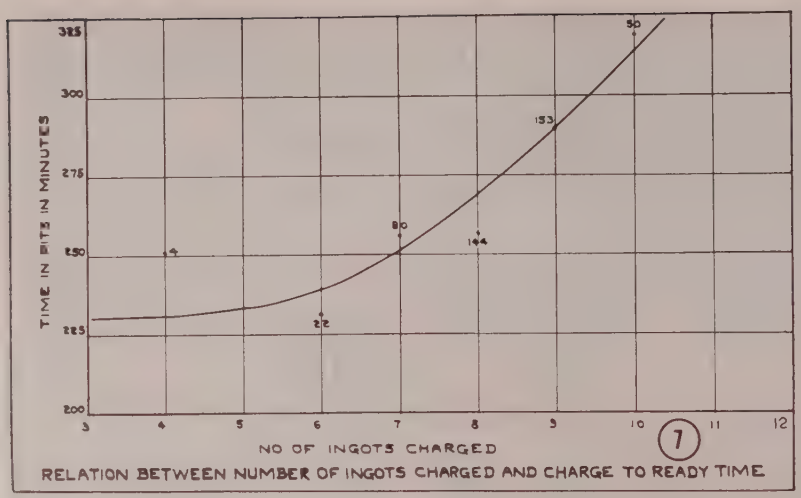
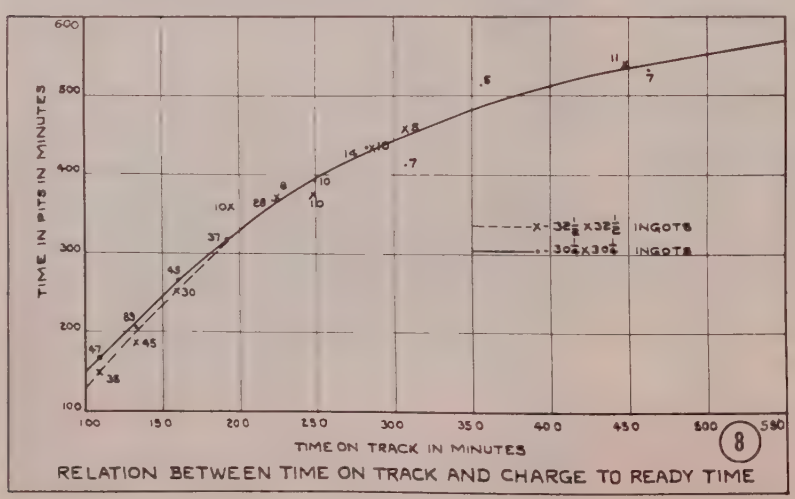


RELATION BETWEEN NUMBER OF INGOTS CHARGED AND CHARGE TO READY TIME

individual lots as they were fabricated would have made an erratic and unintelligible graph, but by use of moving averages, this erraticness is reduced to a point which makes it relatively easy to follow and evaluate. Fig. 6 shows a chronological plot of moving averages of five consecutive lots on this one run. From this chart it is evident that while welding defects show more or less of an increase with time, this is not true of quality defects, and the contention that welding defects were due to steel quality is refuted.

Applications of multiple correlation are probably the most important tool used in statistical quality and production control in a large steel plant. One such problem used to aid in planning production schedules is as follows: A new unit of automatic soaking pits was installed at the rolling mills. Automatic equipment on this unit was adjusted so that proper rolling temperatures would be reached and maintained until the material was rolled. As nothing was known about the heating rate of these pits in relation to size and type of ingots which were to be charged into them, it was desired by rolling mill management to develop as quickly as possible, a correlation involving the number and size of ingots and elasped delivery time between the open hearth and the rolling mill.

Multiple correlation was made involving these three factors. Results of this correlation and their practical application were as indicated by the following graphs and tables. Fig. 7 shows the relation of number of ingots charged to heating time. It is apparent from this chart that the number of ingots charged is related to the charge to ready time or time in pits, which increases approximately 17 minutes for each increase of one ingot. Fig. 8 shows the relation of ingot delivery time to heating time. Here it can be seen that the charge to ready time increase is a curvilinear function of time on track, or ingot delivery time, and at the lower values of time on track there is an approximately constant



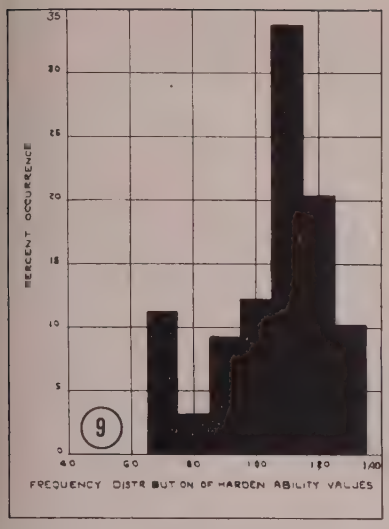
RELATION BETWEEN TIME ON TRACK AND CHARGE TO READY TIME

difference due to ingot size with larger ingots requiring less time in pits than smaller ingots for corresponding track times. Table V shows how these correlation results were reduced to simple tabular form whereby mill heaters could estimate quickly when a certain designated number of ingots of either size would be ready to roll, based on ingot delivery time.

A further problem in multiple correlation analysis is presented in the following example which associates carbon and manganese to a hardenability index on a certain grade of steel. Information obtained from the customer processing this grade of steel pointed out that the most desirable condition was to have a distribution of hardenability ratings with the greatest possible proportion of values above 1.05. This value gave assurance that steel rods in the most common sizes produced would harden satisfactorily. Although the 1.05 minimum hardenability value was desirable, heats as low as 0.95 were satisfactory for certain customers, and a small proportion of heats in this range would not result in difficulty at the rod mill. Values below 0.95, however, could only be processed into smaller sizes, and heats on which pilot rollings showed these lower values had to be held in inventory, until suitable orders were available.

Data used to evaluate the effect of carbon and manganese on hardenability index, consisted of carbon, manganese, quenching-method and hardenability ratings on 98 heats. A frequency distribution of the hardenability ratings is shown in Fig. 9 where it will be noted that distribution is quite erratic, with an abnormal proportion of values on the low side. Information furnished with the data, showed that this condition was due to type of quenching used. Hardenability value for a heat is normally calculated from an oil quenched rod obtained from a pilot rolling. If the hardenability value so obtained was below 0.95, its validity was considered questionable and a water quenched rod was then used as the basis for the hardenability value. This difference was shown to be responsible for the distortion in the frequency distribution.

A multiple correlation analysis was made involving the factors; carbon, manganese and method of quenching from which it was possible to adjust water quench test values to terms of oil quenching and subsequently construct Figs. 10 and 11 which show the independent relation of carbon and manganese on an oil quench basis only. From Fig. 10, it



will be noted that the hardenability value increases 0.025 for each increase of 0.01 per cent carbon, and from Fig. 11 it is evident that the relation with manganese is curved with its greatest influence between the values of 0.60 to 0.80 per cent after which it tends to become less effective. From these two curves, it is possible to estimate the average hardenability index which will be obtained from any given combination of carbon and manganese if oil quenched. Combining the two curves, average hardenability with the lowest combination of carbon and manganese 0.34 and 0.63 per cent, respectively, would be estimated at 0.76, and with the highest combination, 0.44 per cent carbon and 0.90 per cent manganese, it would be 1.22. Combinations such as this will rarely occur, and on the low side, the nearest approach in this study was 0.35 per cent carbon and 0.64 per cent manganese, with a hardenability value of 0.87 as compared to an estimated value of 0.77. On the high side values of 0.44 per cent carbon and 0.84 per cent manganese, give a value of 1.20 compared to an estimated value of 1.24. Using the standard error developed from this analysis makes possible the construction of Figs. 12 and 12A which show the percentage of heats made to a given carbon and manganese, which will fall below a hardenability value of 1.05 and 0.95, respectively. For instance, if a heat has 0.40 per cent carbon and 0.80 per cent manganese the point of intersection of these two elements is determined and the probability of their not meeting the estimated value shown on the chart is read directly from the left hand vertical scale. This carbon and manganese combination shows that approximately 8 per cent of such combinations will fall below the value of

TABLE I
AVERAGE MANGANESE EFFICIENCY ON VARIOUS TYPES OF BLOCK ON ONE GRADE OF STEEL

Type of Block	Number of Heats	Manganese Efficiency Average	Manganese Efficiency σ	Value of "t"	Approximate Chance of Obtaining Average Shown
No. Block Mn in Furnace	40	67.0	12.7	3.1	1 in 450
No. Block Mn in Ladle	10	78.5	10.2	1.4	1 in 6
2000# Spiegel	50	68.0	12.6	2.9	1 in 265
1500# 10% FeSi	28	74.0	10.9	.4	1 in 1.5
2300# 10% FeSi Standard Block	58	73.0	12.0	..	.....
500# 50% FeSi	41	72.0	12.8	.5	1 in 1.6
750# 50% FeSi	29	79.0	7.2	2.7	1 in 145

TABLE II
STANDARD DEVIATION OF MANGANESE CONTENT ON VARIOUS TYPES OF BLOCK ON ONE GRADE OF STEEL

Type of Block	Number of Heats	Standard Deviation	Value of "t"	Approx. Chance of Obtaining Standard Deviation Shown
No. Block Mn in Furnace	40	.045	4.0	Less than 1 in 16,000
No. Block Mn in Ladle	10	.040	1.3	1 in 5
2000# Spiegel	50	.048	5.5	Less than 1 in 1,000,000
1500# 10% FeSi	28	.045	3.4	1 in 1,000
2300# 10% FeSi *Standard Practice* .	58	.031	..	.....
500# 50% FeSi	41	.048	5.0	Less than 1 in 1,000,000
750# 50% FeSi	29	.033	.5	1 in 1.6

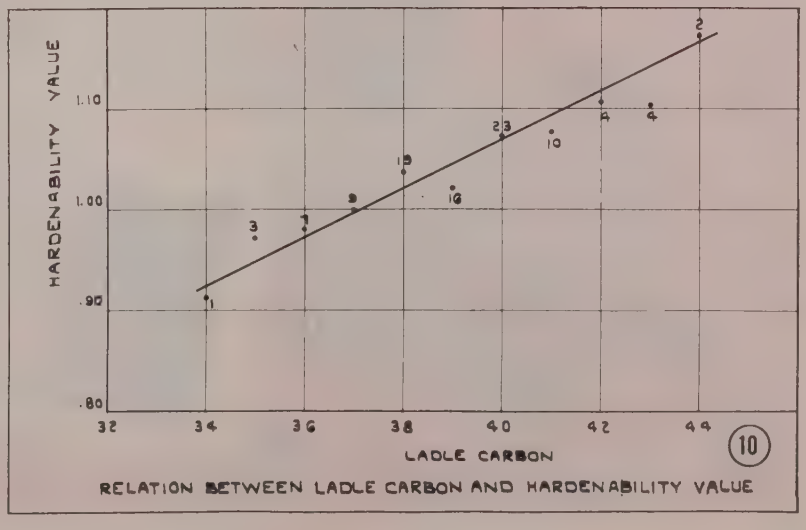
TABLE III
ORIGINAL DATA
PICKLING TIME IN MINUTES

Test Group	Without Agitation Pipe Number 1	2	3	4	With Agitation Pipe Number 1	2	3	4
	80	80	70	80	75	100	65	70
1	80	105	80	100	45	50	40	60
	40	55	60	80	70	80	50	50
	70	75	70	90	75	60	40	70
2	70	105	40	115	50	50	40	60
	58	70	95	115	55	70	45	50
	75	85	70	85	50	60	50	60
3	65	70	80	80	40	90	40	65
	75	85	60	95	50	40	40	55
	45	90	85	90	30	40	40	80
4	70	110	110	100	30	70	40	70
	70	80	90	75	50	50	50	60

TABLE IV
ANALYSIS OF VARIANCE OF PICKLING TIME EXPRESSED IN MINUTES

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square (Variance)	F Value From Data	F Value From Table* 5%	1%	Remarks
Between Treatments (Agitation and no agitation) (T)	14,259	1	14,259.0	60.5	5.1	10.6	Clearly Significant
Between Pipe (P)	6,543	3	2,181.0	9.2	5.9	7.0	Clearly Significant
Between Test Groups (G)	437	3	145.7	0.6	8.8	27.3	Not Significant
Within Triplicates	14,317	64	223.7	1.0	2.0	2.7	Not Significant
Interactions:							
T × P	651	3	217.0	0.9	8.8	27.3	Not Significant
T × G	1,351	3	450.3	1.9	8.8	27.3	Not Significant
P × G	1,886	9	209.6	0.9	3.2	5.4	Not Significant
T×P×G (Remainder)	2,130	9	236.7				
Total	41,574	95					

* Table F values are taken from "Industrial Statistics" by Freeman.



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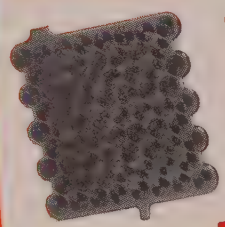
Specially designed to provide dependable power for ELECTRIC INDUSTRIAL TRUCKS

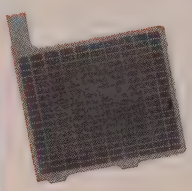
Storage batteries are called upon to perform many tasks. No single type of battery is adequately suited for all. Exide engineers have developed batteries designed to fit each power requirement. They differ in a number of ways, but chiefly in the positive plates around which the other elements are built. In the Exide line there are three basic types of positive plates. The Exide-Ironclad was developed to meet the need for a heavy-duty battery with great reserve power and the ability to discharge at high rates, at high voltage and over a long period of time.

Exide-Ironclad Batteries are DIFFERENT . . . different in design . . . different in construction . . . different in service qualities. Chief among these differences is the unique positive plate, an exclusive Exide feature, which provides advantages not possessed by any other type of plate used in batteries for motive power service. See opposite page for detailed description.



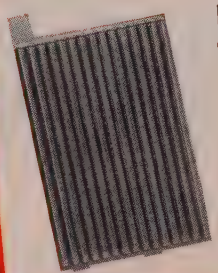
DESIGNED FOR STATIONARY USE

The manchester type of positive plate has the unique lead button construction...rolled strips of corrugated lead, pressed into holes of lead antimony grid. It is widely used by electric utilities, telephone and telegraph companies, radio and television stations... and for railway signal systems, emergency lighting and other stationary applications.



DESIGNED FOR AUTOMOBILE USE

The Exide flat positive plate is of staggered grid construction, pasted with active material which years of experience has proved most efficient and durable for the services for which it was designed. Used for starting, lighting, ignition and other services in cars, trucks, buses, aircraft and general storage battery tasks.



DESIGNED FOR MOTIVE POWER

The Exide-Ironclad positive plate, of slotted tube construction, was developed by Exide Engineers to provide a battery of extra power, sturdiness and durability to meet the exacting needs of motive power equipment. Exide-Ironclad Batteries are noted for high capacity and ability to deliver adequate power throughout each shift. Fully described on opposite page.

1888

DEPENDABLE BATTERIES FOR 61 YEARS

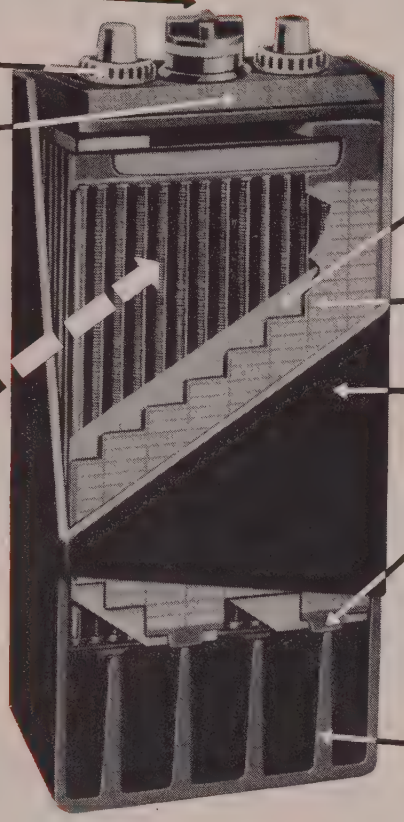
1949

Many Outstanding Features

VENT PLUG
Specially designed to prevent escape of electrolyte.

GREASE SEAL RING NUT
Holds battery elements securely in place . . . prevents creepage of electrolyte . . . keeps tops clean and dry.

SEALED CELL COVER
Flush with top of jar. Prevents collection of dirt or moisture . . . keeps impurities out of cell . . . eliminates leakage of electrolyte.



SEPARATOR
Of high porosity, specially treated to last the life of the battery.

NEGATIVE PLATE
Made extra heavy and built to match the long life of the positive plate.

JAR
Made of specially tough and durable Giant Compound. Built to withstand the jolts and jars of hard industrial usage. Practically unbreakable in normal service.

FEET
Internal short circuits practically eliminated by having the two feet on negative plate rest on different ribs from those of the positive plate, and by having separators extend below both plates and rest on all four ribs.

RIBS
Support all plates and separators. Their height provides generous sediment space, so that internal cleaning is unnecessary.

POSITIVE PLATE

Consists of a series of finely-slotted tubes which contain the active material. So small are these slots that, while permitting easy access of electrolyte, they retard the active material from readily washing out or jarring loose . . . adding considerably to life of plate.

DEPENDABLE POWER

Exide-Ironclad Batteries have ALL FOUR of the characteristics that a storage battery must have to assure maximum performance from battery electric industrial trucks—high power ability, high electrical efficiency, ruggedness and a long life with minimum maintenance. The combination of these four Exide-Ironclad characteristics assures years of dependable day-in, day-out service with economy.

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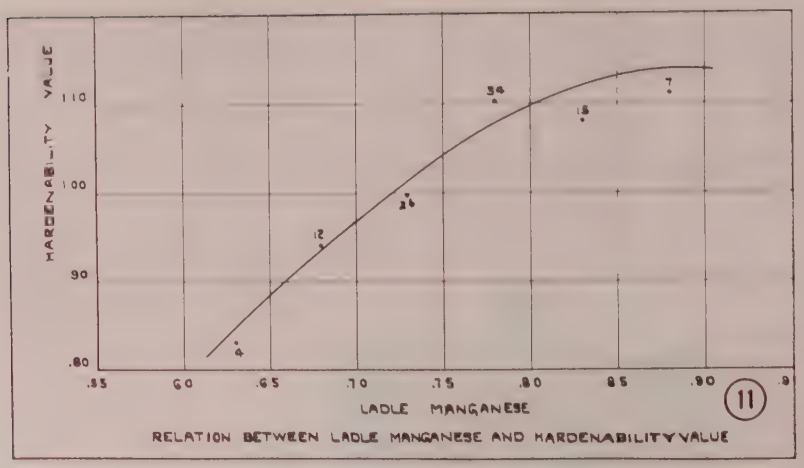


RELATION BETWEEN LADLE MANGANESE AND HARDENABILITY VALUE

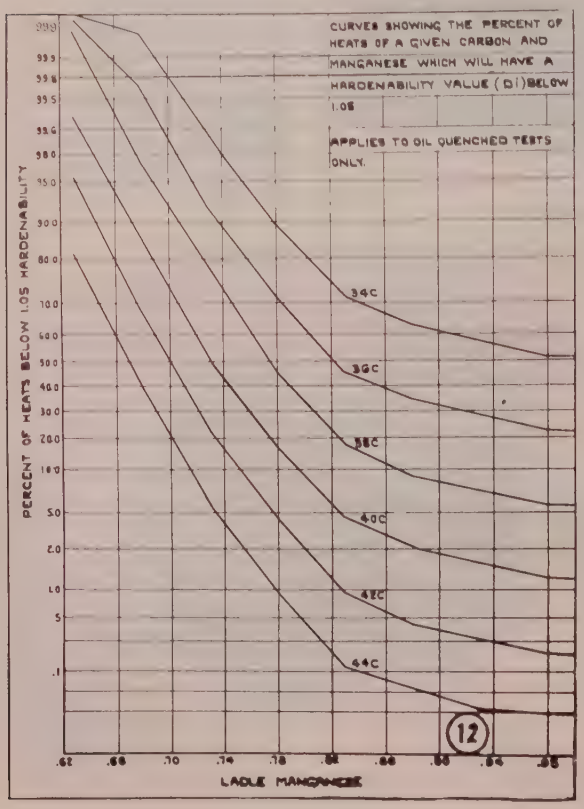
1.05 and 0.8 per cent will be under 0.95.

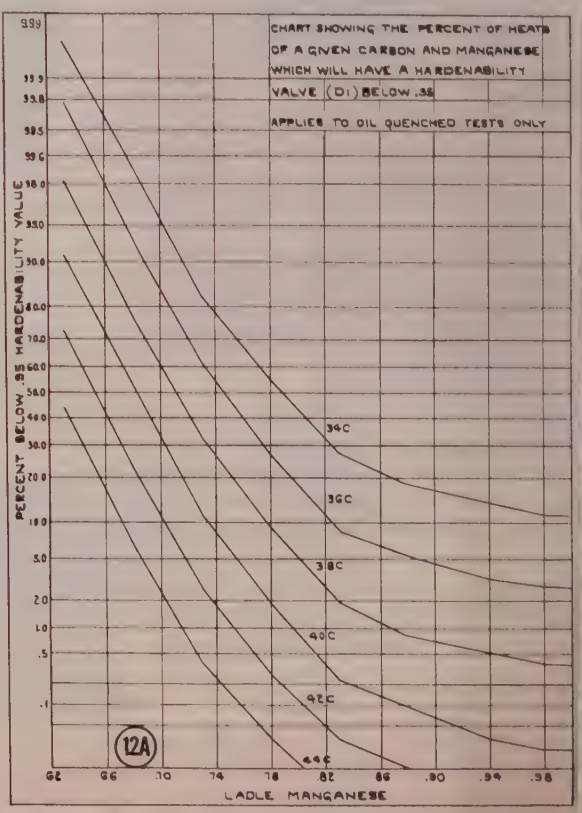
Application of this analysis makes it possible to inform the customer in advance of shipment what can be expected of a given heat with respect to its hardenability value. In this manner, heats which do not have sufficient chance of meeting the 1.05 value, can be anticipated and diverted to those sizes which have a lesser hardenability requirement.

Sampling procedures are not too often applied in a steel mill, but as a matter of interest the effectiveness of two types of sampling procedures are pointed out in the following discussion.

On a certain class of steel pipe, it is necessary to determine the ductility, this is done by taking a deflection test. Details of this test are not necessary to this discussion, but it is desired that we insure each lot against having any pipe below 11.00 inches deflection. A control chart for averages and ranges of samples of 15 pipe from lots of approximately 600 pieces is shown in Fig. 13. It is evident from the graph that process average is 20 inches but the process lacks control with respect to the average from lot to lot. This condition does not hold true, however, with respect to ranges where it can be seen that the average range is 5.28 inches and only two points are out of control. It was deduced from this analysis that while there was considerable variation and lack of control from lot to lot that variation within each lot was fairly constant. On the basis of this reasoning it was decided that the within lot standard deviation could be estimated at 1.50 inches. Using this basic assumption it was decided that the sampling procedure would be to take 15 samples from each lot, determine the average and range and if the range was not out of control on the high side and the average exceeded 15.50 inches the lot would be considered as acceptable. The fallacy of this procedure was soon demonstrated in that no lots were being rejected and occasional samples had individual values below the minimum limit. As a consequence a sequential sampling plan was proposed.

This plan was predicated on the premise that 15.50 inches was the lowest average which could be accepted and 20.0 inches was the process average which was desirable to maintain. The risk of accepting material with an average lower than 15.50 inches had to be low, due to the fact that difficulty was experienced





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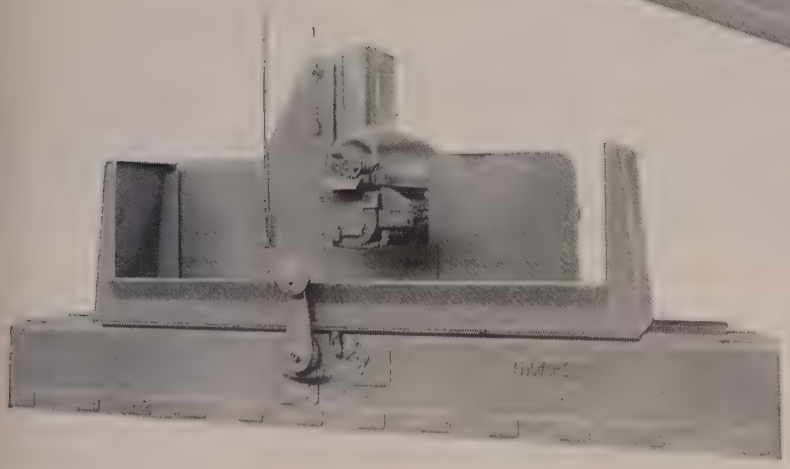

EXAMPLE NO. 1

Above—Thompson Heavy Duty Type CX 30″ x 48″ x 196″ Hydraulic Way Grinding Machine with auxiliary vertical spindle for grinding safety gib, clamp surfaces and rack seats on machine bed. Working capacity of horizontal spindle, 240″. Bed length 46 feet.

EXAMPLE NO. 2

At left—Thompson Heavy Duty Type CX 36″ x 48″ x 120″ Hydraulic Surface Grinder. Equipped with super precision spindle powered with 40 H.P. motor.

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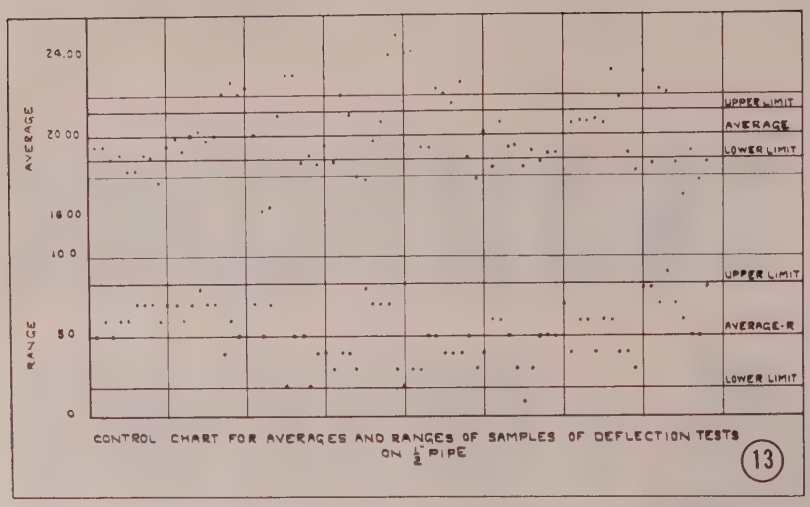
Thompson SURFACE Grinders

The Thompson Grinder Company, Springfield, Ohio



CONTROL CHART FOR AVERAGES AND RANGES OF SAMPLES OF DEFLECTION TESTS ON 1½" PIPE

13

TABLE V

ESTIMATED CHARGE TO READY TIME (HR.-MIN.) FOR VARIOUS TRACK TIMES

No. of 30¼" × 30¼" Ingots					Time on	No. of 32½" × 32½" Ingots				
6	7	8	9	10	Track	6	7	8	9	10
2:38	2:51	3:05	3:25	3:51	2:00	2:18	2:31	2:45	3:05	3:31
3:28	3:41	3:55	4:15	4:41	2:30	3:18	3:31	3:45	4:05	4:31
4:18	4:31	4:45	5:05	5:31	3:00	4:13	4:26	4:40	5:00	5:26
5:08	5:21	5:35	5:55	6:21	3:30	5:03	5:16	5:30	5:50	6:16
5:48	6:01	6:15	6:35	7:01	4:00	5:48	6:01	6:15	6:35	7:01
6:18	6:31	6:45	7:05	7:31	4:30	6:18	6:31	6:45	7:05	7:31
6:48	7:01	7:15	7:35	8:01	5:00	6:48	7:01	7:15	7:35	8:01
7:08	7:21	7:35	7:55	8:21	5:30	7:08	7:21	7:35	7:55	8:21
7:28	7:41	7:55	8:15	8:41	6:00	7:28	7:41	7:55	8:15	8:41
7:48	8:01	8:15	9:35	9:01	6:30	7:48	8:01	8:15	9:35	9:01
8:06	8:19	8:33	9:53	9:19	7:00	8:06	8:19	8:33	9:53	9:19
8:18	8:31	8:45	9:05	9:31	7:30	8:18	8:31	8:45	9:05	9:31
8:28	8:41	8:55	9:15	9:41	8:00	8:28	8:41	8:55	9:15	9:41
8:36	8:49	9:03	9:23	9:49	8:30	8:36	8:49	9:03	9:23	9:49
8:44	8:57	9:11	9:31	9:57	9:00	8:44	8:57	9:11	9:31	9:57
8:52	9:05	9:19	9:39	10:05	9:30	8:52	9:05	9:19	9:39	10:05
9:00	9:13	9:27	9:48	10:13	10:00	9:00	9:13	9:27	9:48	10:13

TABLE VI

CONSTANTS USED IN CALCULATING ACCEPTANCE REJECTION TABLE

M_1	=	Smaller average	= 15.50
M_2	=	Larger average	= 20.00
α	=	The risk of accepting $M = M_2$ when $M = M_1$	= .001
β	=	The risk of rejecting $M = M_2$ when $M = M_2$	= .01
σ	=	Standard deviation	= 1.50
N	=	Number of observations	
EX	=	The value of X for first N observations	
a	=	Value from table for $\alpha = .001$ $\beta = .01$	
b	=	Value from table for $\beta = .01$ $\alpha = .001$	
N_1	=	$\frac{b\sigma^2}{M_2 - M_1} = 2.302$	
N_2	=	$\frac{a\sigma^2}{M_2 - M_1} = 3.449$	
S	=	$\frac{M_1 + M_2}{2} = 17.75$	
EX	=	Rejection value = $SN - N_1$	
EX	=	Acceptance value = $SN + N_2$	

TABLE VII

REJECTION NUMBERS AND AVERAGE NUMBER OF SAMPLES TAKEN BY SAMPLING PLAN

N Number of Samples	Rejection Limit $SN - N_1$ EX^{γ} = Sum of Values	Acceptance Limit $SN + N_2$ EX^{α} = Sum of Values	Actual Distribution of Samples Taken to Make a Decision	
			No. of Samples	Frequency
1	15.45	21.20	1	25
2	33.20	38.95	2	73
3	50.95	56.70	3	5
4	68.70	74.75	4	2
5	86.45	92.20	5	
6	104.20	109.95	6	1
7	121.95	127.70	7	
8	139.70	145.45	8	1
9	157.45	163.20	9	1
10	175.20	180.95	10	1
11	192.95	198.70		
12	210.70	216.45		
13	228.45	234.20		
14	246.20	251.95		
15	263.95	269.70		
			Total	109
			Average	2.1

with fabricating material with low deflection. On the other hand risk of rejecting good material was not of great importance, as rejected lots could be diverted into other orders where this property was not too important. On this basis the risk of accepting material with low deflection M_1 was set at 0.001 and the risk of rejecting good material M_2 was set at 0.01.

Using these values a sequential sampling plan was calculated from the basic statistics as shown in Table VI. Table VII shows the acceptance and rejection numbers together with average sample size and a distribution of the actual number of samples taken on 109 lots. Here it will be seen that average sample size by the sequential method can be reduced to 2.1 as compared to 15 by the original method. This method also is more efficient as shown by the fact that 3.7 per cent of the lots sampled would be diverted to orders which do not require such close control of the deflection property.

The foregoing discussion has presented in as great detail as possible the workings of statistical quality control in a large steel mill. It can be seen that application of various statistical techniques are quite necessary in this field. These comments pertain only to problems found in a large steel plant, and while it is not contended that this exact procedure will apply to all industrial plants it is felt that the basic method of application is adaptable in most self-contained manufacturing plants.

ACKNOWLEDGMENTS

The author wishes to acknowledge the assistance of R. C. McQuattie, J. O. Light, J. D. Tyson for reviewing the material presented, and the management of the National Tube Co.

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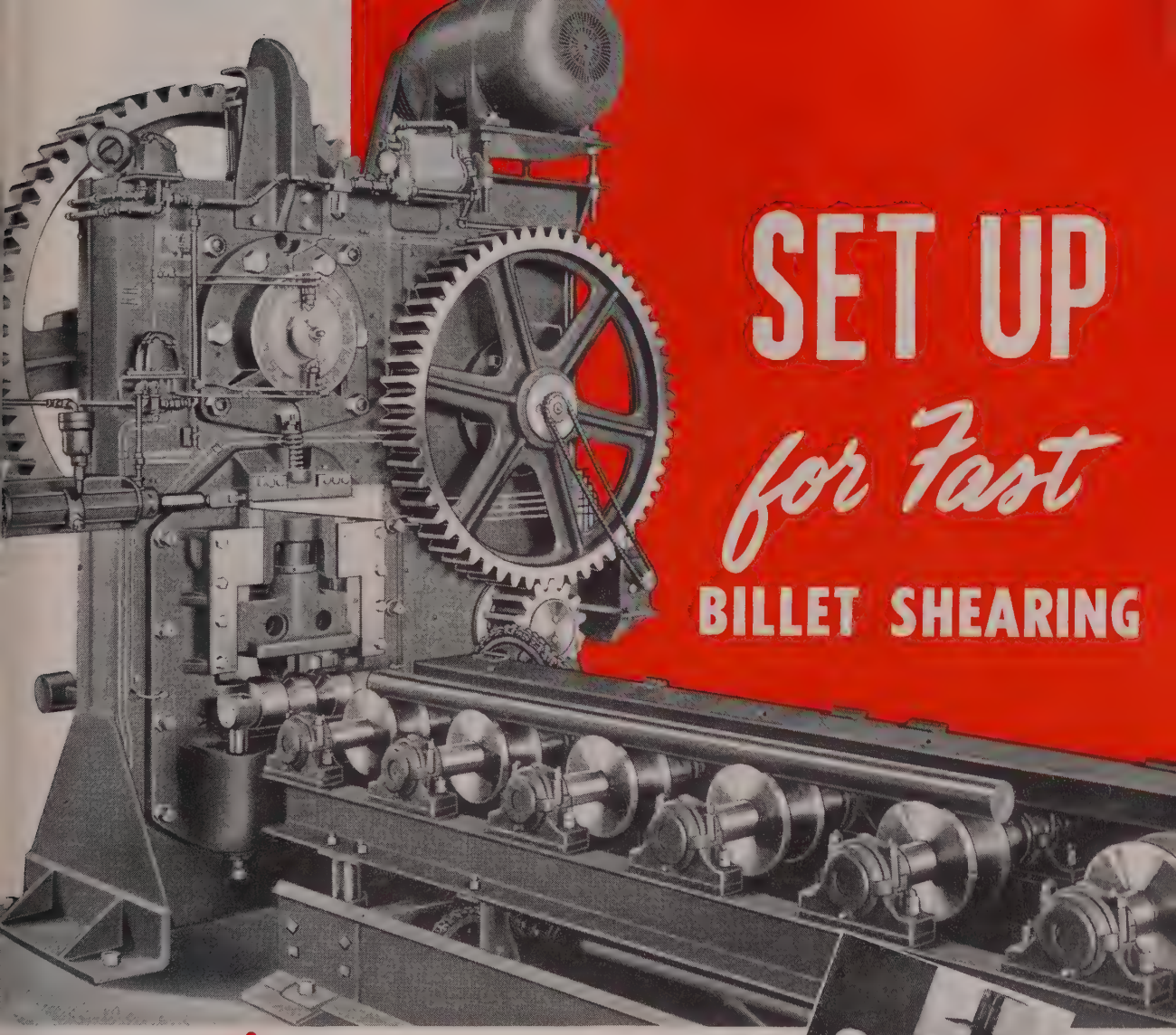
A fluxing agent with improved wetting and penetration action, for all types of hard soldering, brazing and welding, has been granted a patent, assigned to Special Chemicals Corp., New York. Known as Kwik Flux No. 54, it is suited for use on stainless steel, iron, steel, copper and brass, monel, nickel, etc. It will function with direct flame, gas hydrogen, acetylene and muffle and induction heating.

—o—

Corrugated roofing and siding made of galvanized steel, bearing the name "Strongbarn," has been patented and is being produced by Granite City Steel Co., Granite City Ill. Perfected shortly after the war after having been in the process of development since 1937, the material is said to be 56 per cent stronger than conventional roofing and siding and is 21 pounds per square inch lighter than 26 gage material, yet equal in strength.



SET UP *for Fast* BILLET SHEARING

No. 11 "Buffalo" Billet Shear with Automatic Feed Table

"Buffalo" BILLET SHEARS

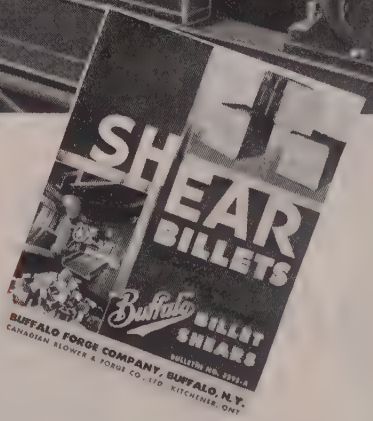
MODERN forging shops need a machine that will not only cut round or square stock squarely and with no "smearing", but at a good rate of speed.

"Buffalo" Billet Shears are doing just that in literally hundreds of shops. The No. 11 Shear above, for instance, handles 4" square stock, 18 cuts per minute. Ten other sizes available shear from 2¼" rounds up to 10".

As an illustration of this fast, clean cutting, one of many successful applications of "Buffalo" Shears is high production work on stay-bolt stock —clean, square cuts for full thread.

What about endurance where 24-hour operation is customary? Some of the "Buffalo" machines built prior to 1915 are still on "active duty".

If you cut billets, you'll save money now—and years from now—with "Buffalo" Shears on the job.



Electrically-Welded Steel Plate Frames —simple, positive controls—fast, accurate shearing—capacities to suit your operation—read about these "Buffalo" features in Bulletin 3295-A. Write for your copy now—it may be the economical solution to YOUR shearing problem.

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

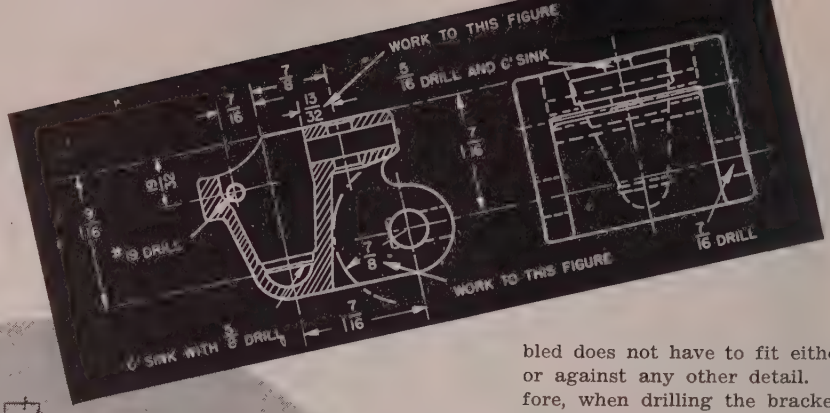
158 MORTIMER STREET — BUFFALO, NEW YORK

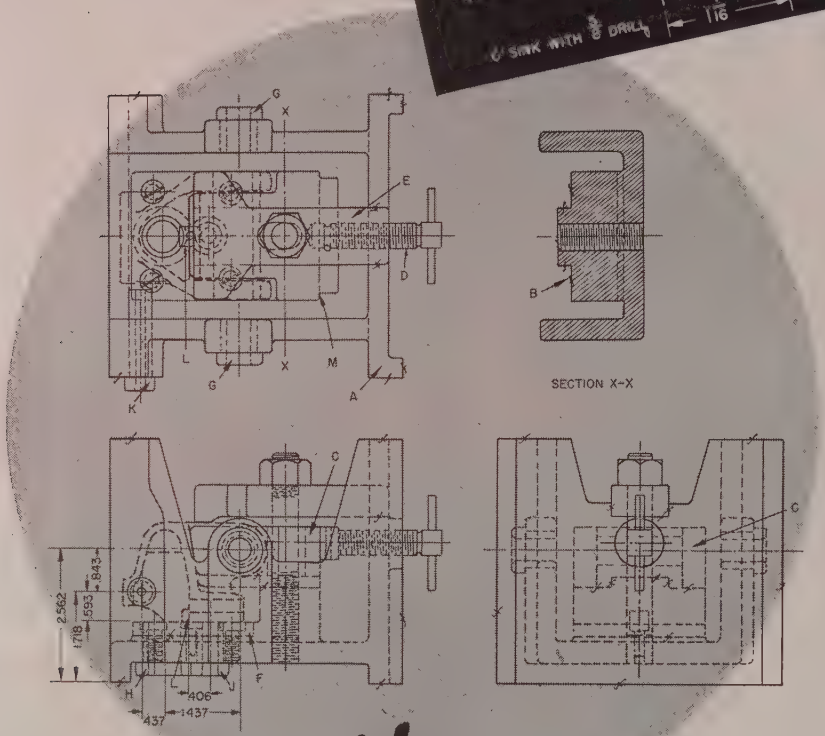
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

Fig. 1 (right) — Caster roll swivel bracket—example where an unfinished surface is used as a locating medium for machining operations

Fig. 2 (below)—Several views showing features of special combination drill jig and checking fixture that simplify processing bracket in Fig. 1





SPECIAL JIG AND FIXTURE

Unifies Drilling and Inspection Procedure

By ROBERT MAWSON

WHEN performing machining operations, it usually is considered good tool designing practice to provide a finished surface on the workpiece for locating jigs or fixtures. With such a procedure, there is a much better chance that the machined pieces will be interchangeable, a detail that often is necessary or advisable when the pieces are sent out for repair purposes.

On some work, however, it is not practical to locate the piece from a finished surface. This would require an additional operation and, naturally an increase in manufacturing cost. Also when a detail does not depend on other parts for the required accuracy the machining operation can be successfully performed by locating the workpiece from an unfinished surface.

Example of this latter condition is shown in the illustration, Fig. 1, which is a caster roll swivel bracket. This cast iron bracket, when assembled does not have to fit either into or against any other detail. Therefore, when drilling the bracket it is only necessary to maintain the 7/8-inch dimension, and to machine the several holes in the positions shown. Thus it is possible to use an unfinished surface as a locating medium for the machining operations.

Locating Block Track Guided— Special combination tool, Fig. 2, used when drilling various holes in the bracket is made with a cast iron body, A, finish machined on the surfaces F. The center portion of the body is provided with a raised section which is machined to form a track, B. In this track slides a machine steel locating block, C, which is machined at the inner end to move between the two arms of the workpiece. Extreme end of the block is machined with a similar contour surface as the cored opening at the ends of the arms.

The locating block is moved in or out with the ½-inch screw, D, which passes through a threaded hole in the vertical wall of the jig body and an unthreaded portion of the screw is placed in a reamed hole in the locating block. Near the end of the portion of the screw in the block is machined a recess in which is a steel pin, through a drilled hole in the block. Thus the screw can rotate, yet it is held in the locating block.

Workpiece is held in position in the drill jig with a three-point contact machine steel clamp, E. The three contact points are the right hand wall of the jig body, and the arms of the workpiece. The clamp is tightened on the workpiece with a hexagon nut on a stud which is threaded into the jig body.

The workpiece is located for its correct height by resting on a machine steel, carbonized and hardened plate F, that is attached to the jig body with four filister head screws. Two 7/16-inch tool steel, hardened and ground, guide bushings, G, are accurately located to drill the holes in the two arms of the workpiece. A tool steel, hardened and ground bushing, H, is also accurately positioned to guide a 5/8-inch drill for countersinking the bottom of the cored ho

. . . that wearing out an old machine is expensive

Of course, you know that an obsolete machine, even with its low carrying charges, usually costs more to run than a new one. Your treasurer probably knows that, too; but it won't hurt to remind him that the best time to replace old machines is before they are completely amortized on the books. For, an automatic five years old is dangerously below today's Acme-Gridley production standards.

If you have seen new Acme-Gridley Automatics in action, you know that doubled production is not uncommon. Maybe we could help you prove this point for your treasurer—by placing in your hands more case histories of the actual experiences of some of our customers—down-to-earth records of dollars saved with new Acme-Gridley Automatics. Here's a typical example:

CUT THIS OUT FOR USE WHEN YOUR TREASURER WANTS PROOF

AN ACME-GRIDLEY CERTIFIED CASE STUDY

THIS IS WHAT HAPPENED

MACHINE—2" RB-6 Spindle Acme-Gridley Automatic

PART TURNED—Steel Eccentric Bushing

MACHINING TIME—17½ seconds—for 15 operations

FORMER METHOD—Blank out on automatic, then on second machine, finish eccentric shoulders, internal recess and gouge O.D.

PRODUCTION INCREASE—300%

AND HERE'S ONE IMPORTANT REASON

THE ACME-GRIDLEY CROSS SLIDE is rigidly supported, low in the frame, without overhang, and has easily adjustable gibs on hardened steel ways. This design provides direct contact between the drum cam and roll, and at the center of the slide. Positive cam control is insured and excessive linkage is avoided. Moreover, there are fewer parts to wear.

Generous open space around the slides gives more chip clearance, and more efficient operating convenience, through greater accessibility to tools—all factors that insure accuracy, increased production and lower costs.

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ACME-GRIDLEY BAR and CHUCKING AUTOMATICS built in 4, 6 and 8 spindle styles, maintain accuracy at the highest spindle speeds and fastest feeds modern cutting tools can withstand.

in the workpiece. The bracket requires two 5/16-inch holes to be drilled in alignment and the tool steel, hardened and ground bushing J, is used to guide the tool for machining these holes. These holes are then countersunk after the workpiece is removed from the drill jig.

Bushing Simplifies Drilling—A tool steel, hardened and ground bushing K, which was accurately located previously is used to guide the No. 1 drill for machining a hole in the workpiece. Positioning block shown at L is of tool steel, and is placed in a slot machined in the plate, F, and held in position by a pin, an integral part of the block, which is driven in a reamed hole in the plate F and the body of the jig body.

To use the combination tool, as a checking fixture: The clamp, E, is first moved back and one of the workpieces is placed on the upper surface of the plate, F, and in contact with the edge of the block, L. The screw at D is then moved in by means of the pins in the screw head. Movement of the screw brings the inner surface of the movable locating block, C, in contact with the workpiece. When the block is moved as far as possible and it is found that the corner, M, projects from the face of the vertical face of the jig body it will prove that the cored hole between the arms of this workpiece does not have the desired dimension called for on the detail. This indicates that the workpiece is defective.

However, if the corner does not project, the piece is suitable for the machining operation. The clamp is then tightened down with the hexagon nut on the threaded stud, after the clamp is moved over the workpiece, and the bracket is held securely in the jig. A 7/16-inch hole is then drilled in each arm of the workpiece, the bottom of the cored hole is countersunk to the proper depth, a No. 19 hole is drilled, and two holes machined with a 5/16-inch drill, the jig being rotated and placed with its proper surface on the drill press table.

Work Easily Removed—To remove the finish drilled piece it is only necessary to move back the clamp for a short distance, screw back the locating block by means of the screw and the work can be lifted out of the drill jig.

This tool is a good example of a well designed production device: It locates the workpiece accurately which is held securely with a minimum of motions on the part of the operator, also steel details have been provided, where necessary, to resist wear. Furthermore, the jig can be operated easily and quickly.


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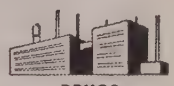
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They're all equally as important as mines and rolling mills

TO MAKE MORE STEEL

Half the melting stock used in a steel mill or iron foundry consists of scrap.

In normal times, enough scrap is produced by the mills, foundries, railroads, scrap dealers and fabricators to fill the need.

But although the mills are now working at capacity, the greatly increased demand for steel and castings has outstepped the supply of the heavy scrap that makes the best steel—and at the fastest rate.

The quickest way to increase the production of steel and castings is to increase the supply of heavy scrap.

That is why we are calling on plants in NON-METALWORKING industries to provide the needed heavy scrap NOW.

One million extra tons are needed!

You Have the Heavy Scrap Needed to Make More Steel

Enough obsolete machinery, equipment and parts are being carried as useless inventory in *non*-metalworking plants to give a big push to the production of steel. Surveys have proved this.

The trick is to get that old iron and steel into the hands of the steel producers and foundries.

We're putting that job up to *you.*

To help increase steel production . . . provide more steel for fabricating the equipment you want . . . *to build an emergency reserve for national security* . . . turn in your useless heavy scrap to your local scrap dealer.

What You Can Do to Help Step Up Steel Production

1. Appoint one top official in your plant to take full responsibility for surveying the plant and getting out the heavy scrap.
2. Consult with your trade association's Scrap Drive Committee about its program to help the scrap drive.
3. Call on your local scrap dealer to help you work out a practical scrapping program.

A PUBLIC SERVICE PROJECT THE ADVERTISING COUNCIL

SCRAPPY SAYS:
Search your plant for HEAVY SCRAP
...Help make MORE STEEL!

STEEL

Localized Corrosion

(*Concluded from Page 89*)

surfaces under barnacles or in contact with wood upon exposure to sea water. Similarly, the local pitting of aluminum alloy surfaces which are in constant contact with wet absorptive insulation materials may be explained on this basis. Fig. 4 illustrates corrosion of an aluminum alloy resulting from oxygen screening.

Contact with Other Metals—Corrosion currents of substantial magnitude may be caused by contact between different metals, generally known as galvanic corrosion. One point stressed by Dr. Mears, is that the electromotive series is not dependable as a base for predicting which metal of any couple will suffer galvanic attack when coupled to a different metal and exposed to any solution. The reason is that the solution potentials of the different metals alter as the solution in which they are exposed is changed. Thus, in order to be certain whether or not contact between two metals will result in galvanic attack of a certain one of the metals it is necessary to measure the potentials of these metals in the particular solution under consideration.

Other factors may influence localized corrosion. Currents caused by externally generated potentials are responsible for certain severe cases of corrosion. Probably underground structures, such as pipe lines, lead-sheathed cables, etc., suffer the most attack from this source. Differential heating and differential illumination can cause corrosion currents since the different metal areas develop different solution potentials.

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Economic aspects of the fluorspar industry and review of the chemical developments affecting the use of fluorine chemicals in industry are covered in report of investigation No. 141, "Fluorspar and Fluorine Chemicals," published by University of Illinois, Urbana. It was prepared in co-operation with the Office of Naval Research and the University of Illinois.

Distortionless Broaching

. . . thin-walled aluminum castings at 30 feet per minute

RELATIVELY light or thin-walled castings—when properly supported and backed up—can be broached just as accurately and easily as heavier sections, as illustrated by the broaching of the inside faces of an aluminum typewriter carriage frame, Fig. 1.

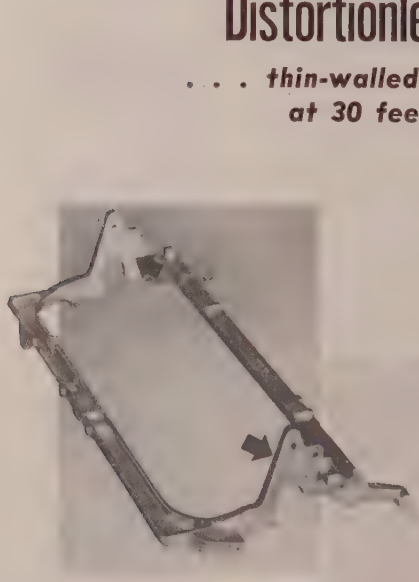

Fig. 1 (above)—Inside faces of this light aluminum typewriter carriage frame are broached simultaneously without distortion or buckling of the part. Locating and clamping is from both sides, eliminating tendency to distort during the cutting stroke

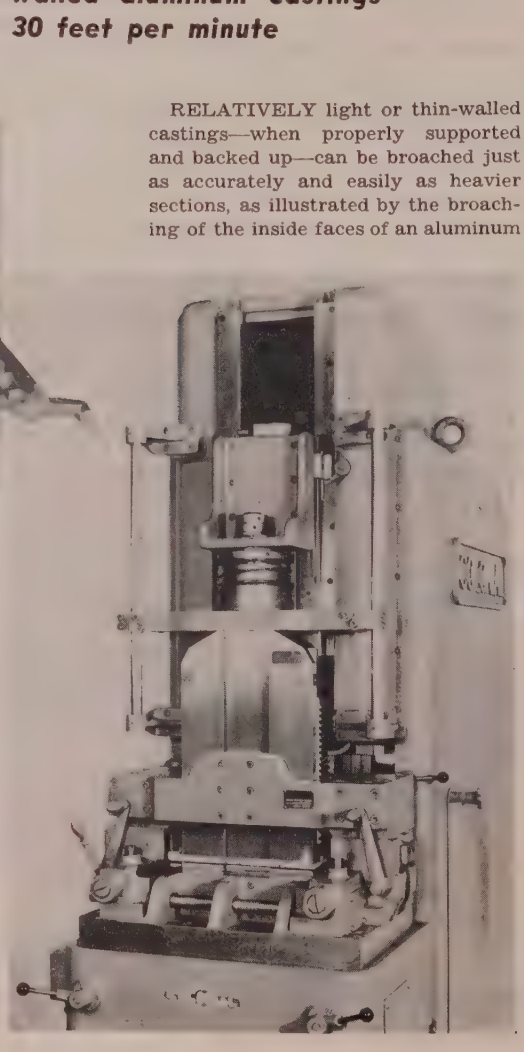

Fig. 2 (right) — This 6-ton pull-down broaching machine, with a 36-inch stroke, is used for broaching the part shown in Fig. 1

Both faces (the broached surfaces are indicated with arrows in Fig. 1) are cut simultaneously with a wide broach. Broaching machine is a 6-ton full-down unit with a 36-inch stroke manufactured by Colonial Broach Co., Detroit. The work-holding fixture is so designed that the part drops into it with the long "ears" down. Locating and clamping is from both sides, insuring that the part is equally supported directly back of the faces being broached. With this setup, there is no tendency for the light casting to distort during the cutting stroke.

Broach itself is composed of a wide broach holder having a surface broach insert mounted on each side. The recess in front of the broach holder aids in accurately guiding the broach through the guide plate above the work. Broach handling on this machine is semiautomatic, no manual handling of the broach being required.

Part is removed with the broach in the base of the machine. A new part is loaded in place after the broach has been returned to the top of the stroke, where it is retained in place by the broach-handling puller. Bar across the center of the machine, as shown in Fig. 2, is a part of the puller release mechanism.

Broach speed on this particular job is 30 feet per minute. This means that the actual cutting stroke—to machine both faces—requires only 6 seconds. Broach return time is 3 seconds.

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A 188-page booklet has been published by Wickwire Spencer Steel Division of Colorado Fuel & Iron Corp., commemorating the 50th anniversary of wire rope making at the company's Palmer, Massachusetts plant.

Wheel Dressing Tools

(*Concluded from Page* 90)

a rack-and-pinion hand press, Fig. 2, using a small steel punch which fits the hole snugly. The bit is held securely by placing it in the proper hole in a drilled steel block which will handle all of the six sizes produced.

After the initial compacting process the hole is again filled level with the powdered metal and a suitable diamond selected for location in the center of the filled hole. Care must be exercised to have the diamond in proper position so that the best corner is exposed for service. A compacting punch which has been hollowed out at the end to fit over the exposed diamond is used to give a final compacting to the powdered metal.

Next the bit is transferred to a fixture surrounded by a ring gas burner, Fig. 3, which heats the shank, while an overhead burner can be lowered to suitable position to play over the end in which the diamond is set. As the piece comes to heat (1150° F), a rod of silver solder is held over the top and allowed to flow down around the diamond and into the powdered metal, strengthening the seating of the diamond. The special flux in the metal powder mixture furnishes the proper "wetting" action literally to armor the diamond with metal and solder, anchoring it firmly and at the same time providing intimate contact to conduct heat away from the diamond into the surrounding metal when it is cutting a grinding wheel. At the 1150° temperature, the metal powders are not melted but provide sufficient capillary attraction to draw the molten silver solder down into the powder and envelop each grain.

No Skill Involved—After the burner flames are shut off, the bit is dropped through a convenient hole in the top of the bench, depositing it in a tray where it is allowed to cool. Finally the bit is placed in the bench lathe and the end turned down to conical shape, exposing the diamond at the point.

The method is fast and simple, requiring no particular degree of skill on the part of the operator, once he has learned the technique. Thousands of wheel dressing tools are in use daily throughout the Ford manufacturing operations and there is a steady replacement need. Some worn tools can be reprocessed but usually the diamond has deteriorated to the point where its only value is for grinding up into diamond dust.

From Plates to Nuts

The same attention and expediency with which heavy plates and structurals are handled at Hanlon-Gregory —are given to *all* orders . . . Nuts, bolts, screws, rivets —that require protection against rust—*all* receive the best possible coating of protective zinc.

No order is too small for the world's largest hot-dip job galvanizing plant.

THE WORLD'S LARGEST *and Fastest* JOB GALVANIZING PLANT

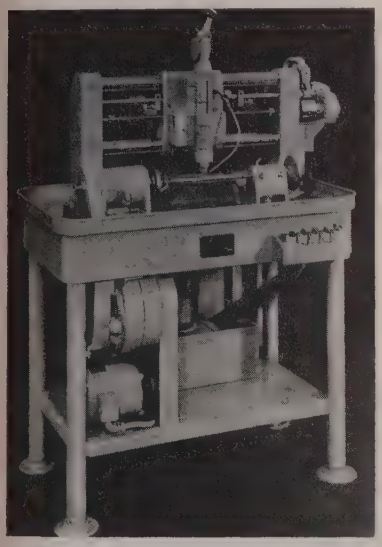
HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania

GALVANIZING . . . PICKLING . . and OILIN

Finishing Machine

Spindle speeds variable from 40 to 1000 rpm allow the operator of the model 50 superfinishing machine, made by Gisholt Machine Co., Madison, Wis., to select the proper speed for the degree of surface finish required. Designed to handle medium



to small cylindrical parts, machine has a capacity of 12 inches between centers, an 8½-inch swing with a 3-inch maximum working diameter and a workpiece weight of 100 pounds. The quill is spring loaded and adjustable from 0 to 45 pounds of pressure.

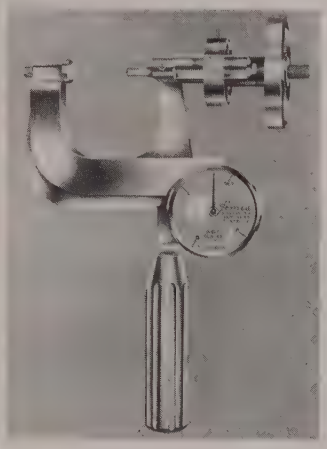
Machine is equipped with an adjustable tailstock and a complete lubricant system. One of two standard attachments available, a motor driven traverse attachment, is shown installed on the machine. The other attachment, a centerless roll drive attachment is offered for parts that have no centers. Machine may be used in finishing such small parts as plug gages, hydraulic cylinders, pistons and shafts of all kinds.

Check No. 1 on Reply Card for more Details

Hardness Tester

Dies, knives, cutters, saws, gears, round and flat stock, tubing and odd-shaped parts up to 2 inches in diameter may be tested for hardness with the 2½ pound model 2 hardness tester announced by Ames Precision Machine Works, Waltham 54, Mass. The rockwell penetration method of testing is accomplished by applying pressure to the penetrator by screw action. Tests are made directly in the rockwell scales, with the penetrators and pressure loads specified in the rockwell conversion chart. Brinell equivalents can be figured.

As the large handwheel on the tester is turned to increase the pressure, the frame is forced open and the lever on the front of the frame lifts, causing the indicator hand to move around the dial. The action is small and can be continued indefinitely without altering the frame. Reversible anvils and penetrators, special anvils and larger ball penetrators are supplied to further increase the number of applications. Complete



equipment includes a diamond penetrator, one 1/16-inch ball penetrator, one short and one long flat anvil, one short and one long V-anvil, two hard steel test blocks, and one brass test block.

Check No. 2 on Reply Card for more Details

Feed Controller

When nose-mounted through a bracket attached to the moving element of any feeding mechanism, the power check precision feed controller, made by National Pneumatic Co., Graybar Bldg., New York, N. Y., may be employed to automatically retard speed and ease pressure at any or all points of feed-travel. If applied to pneumatic or manual drill press feed, it can be adjusted to retard the drill during the whole operation or to ease the drill through only at the breakthough point where most drill breakage occurs.

Unit consists essentially of a hydraulic cylinder and an operating rod on which simple fittings are quickly spaced and preadjusted, during the setting up of the machine, to provide a retarding pull up to 1000 pounds at the desired control points of feed-travel. Strength of pull is regulated by an external setting. Units are offered with 2, 3, 4 or 6-inch stroke and may be attached to drill press spindle bracket, air cylinder piston rod or bracket on feed table of a milling machine or grinder.

Check No. 3 on Reply Card for more Details

Motorized Hand Truck

Powered by a 4-cycle 1½ horsepower gasoline engine, the motorized hand truck built by Comet Mfg. Co., Inc., 9253 Nicollet Ave., Minneapolis 9, Minn., is capable of negotiating 20 per cent grades and has a speed of 2 to 5 mph. Started with a kick starter, the truck has a full chain-drive and centrifugal clutch which transmits power through a jack-shaft to the heavy-duty demountable rubber-tire wheels. Both wheels have roller bearings and are equipped with friction drive.

Loads up to 2000 pounds may be handled. Handle length is 60 inches

and overall length 24 inches. Lever type hand throttle on handle of truck provides finger-tip control for smooth starting and stopping. The lever type hand brake is on the other handle. Model 105 has a chime hook, concave drum carriage and drum fork.

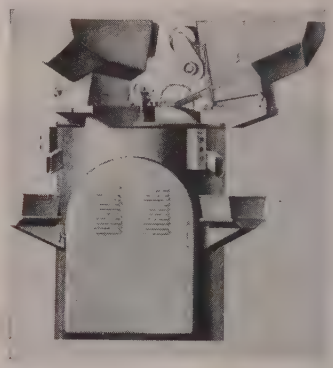
Check No. 4 on Reply Card for more Details

Thread Roller

Production rate of 750 headed machine or cap screws per minute at normal hardness or 375 per minute preheat treated is claimed for the new planetary hyper-production thread roller announced by Batchelder Engineering Co., 10 Park St., Springfield, Vt. Known as Beco model 312, it uses one externally threaded continuously rotating cylindrical inner die and three internal-

ly threaded stationary external segment dies. Three independent automatic feeds deliver blanks to each of the outer dies.

Blanks having three different types of heads can be rolled simultaneously, if desired, and drop into separate work baskets to prevent mixing. Design provides that six screws are

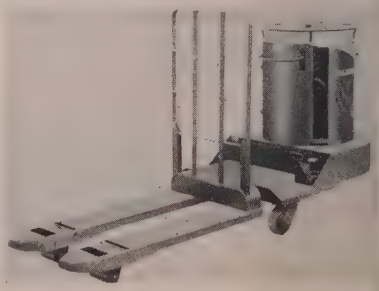


always being rolled at any given instant. When rolling preheat treated stock a single lobe cam is substituted for the normal double lobe cam and blanks are started half as often. One or two dies can be replaced if accidentally damaged without replacing the entire set. Slip clutches are provided in case of jams.

Check No. 5 on Reply Card for more Details

Pallet Truck

Intended for use in picking up practically any pallet, the Palletruk, built by Salsbury Corp., 1161 E. Florence Ave., Los Angeles, Calif., is equipped with two 9-inch forks, 48 inches long, and spaced 9 inches apart. A 4-inch lift is provided for ample clearance above the floor. The truck is fully articulated to permit



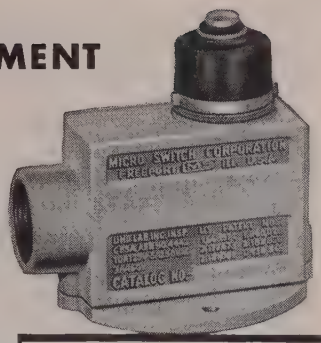
handling pallet loads over sharply pitched irregularities in floor levels with danger to load stability.

Truck can negotiate aisles only slightly wider than the pallet being handled. It turns in its own length. Power is furnished by an air cooled Wisconsin engine and loads up to 4000 pounds may be handled on a 15 degree ramp. The fully rotatable

THESE PLANTS BROUGHT PRESENT EQUIPMENT

UP-TO-DATE with

MICRO Precision Switches!



MICRO SEALED TYPE DIE CAST ENCLOSED PRECISION SWITCH

A popular design with plant managers, foremen, time study men and others faced with the need for modernizing plant machinery.

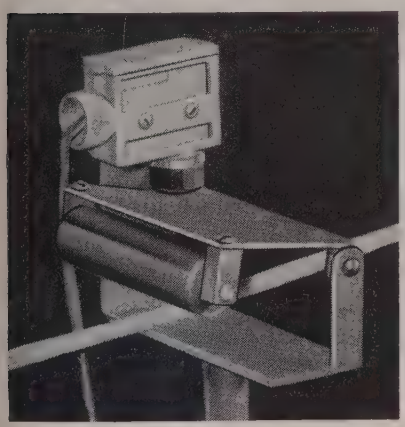
In modernization of present plant equipment, the use of MICRO precision switches has solved difficult problems for hundreds of industrial plants.

Use of MICRO precision switches has increased machine capacity, reduced repairs and work spoilage, and made it possible for one man to supervise the operations of more than one machine.

The applications shown here are but a few of the thousands of uses for these accurate, precise, dependable switches.

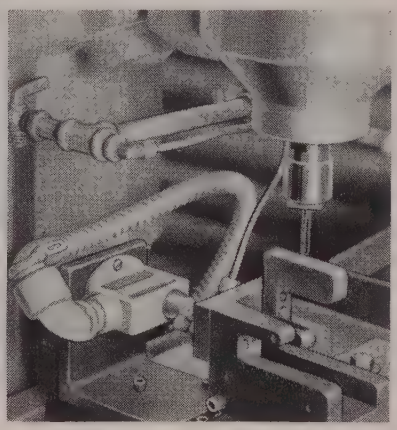
MICRO precision switches are provided with sturdy metal housings that are resistant to shock, dust and moisture.

MICRO SWITCH sales engineers, experienced in solving control problems in every type of industry, are conveniently located to help you with advice on the most practical and economical method of making your machinery more productive. Write to the MICRO SWITCH branch nearest to you, or to MICRO SWITCH, Freeport, Illinois.



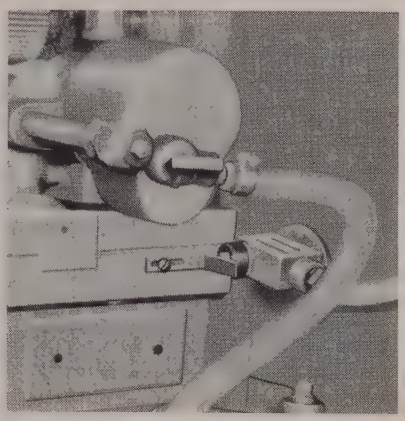
How to Save Costly "Slack" Trouble in Wire Winding

This sealed type MICRO precision switch is mounted on a device which allows this wire-winding machine to operate only when the wire passing through the roller is taut. Its installation completely eliminated broken needles, broken yarn and lost time which had previously developed whenever the wire became "slack." As soon as the "slack" is relieved, the wire tightens against the roller, and the switch starts the winding machinery in operation.



How to Save Time on Tapping Operations

Here a sealed type MICRO precision switch is used to assure proper positioning for tapping operations. It makes sure that the machine will not start unless the work has been properly positioned in the jig. Use of this switch has saved many rejects, reduced tap breakage, and saved overall tapping time. This type of arrangement is easily installed by a maintenance man or plant engineer.



How to Handle More Than One Machine At A Time

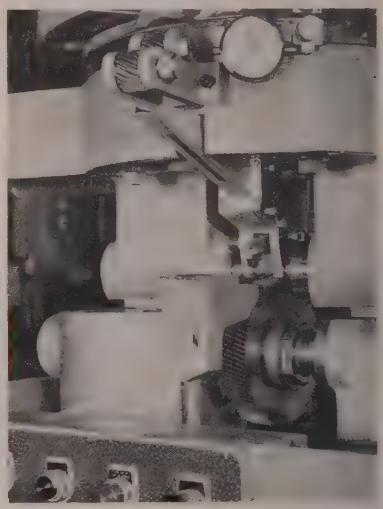
An arm on the carriage of this hobbing machine contacts a sealed type MICRO precision switch at the end of its travel. The switch stops the machine automatically, and turns on a light that signals the operator. He places new work in the machine, sets it in operation and goes about his duties at another machine. MICRO precision switches provide many ways to save time with present equipment.

turret power unit provides complete maneuverability and constant truck motion without the necessity of gear shifting. This is accomplished by the inclusion between the engine and the drive wheel of a fully automatic clutch and transmision.

Check No. 6 on Reply Card for more Details

Gear Machine Gage

Michigan Tool Co., 7171 E. McNichols Rd., Detroit, Mich., is announcing the addition of a semiautomatic gaging device to its automatic loaders for its gear finishing machine. It mounts at the "loading" end of



the chute leading into the machine, consists of two gears used to gage the pinions being finished and mounted so that they can revolve freely. The center distance between the two gaging gears is such that a pinion with an oversize diameter, or one on which the stock is excessive for best shaving results, will not drop through between the gears into the machine.

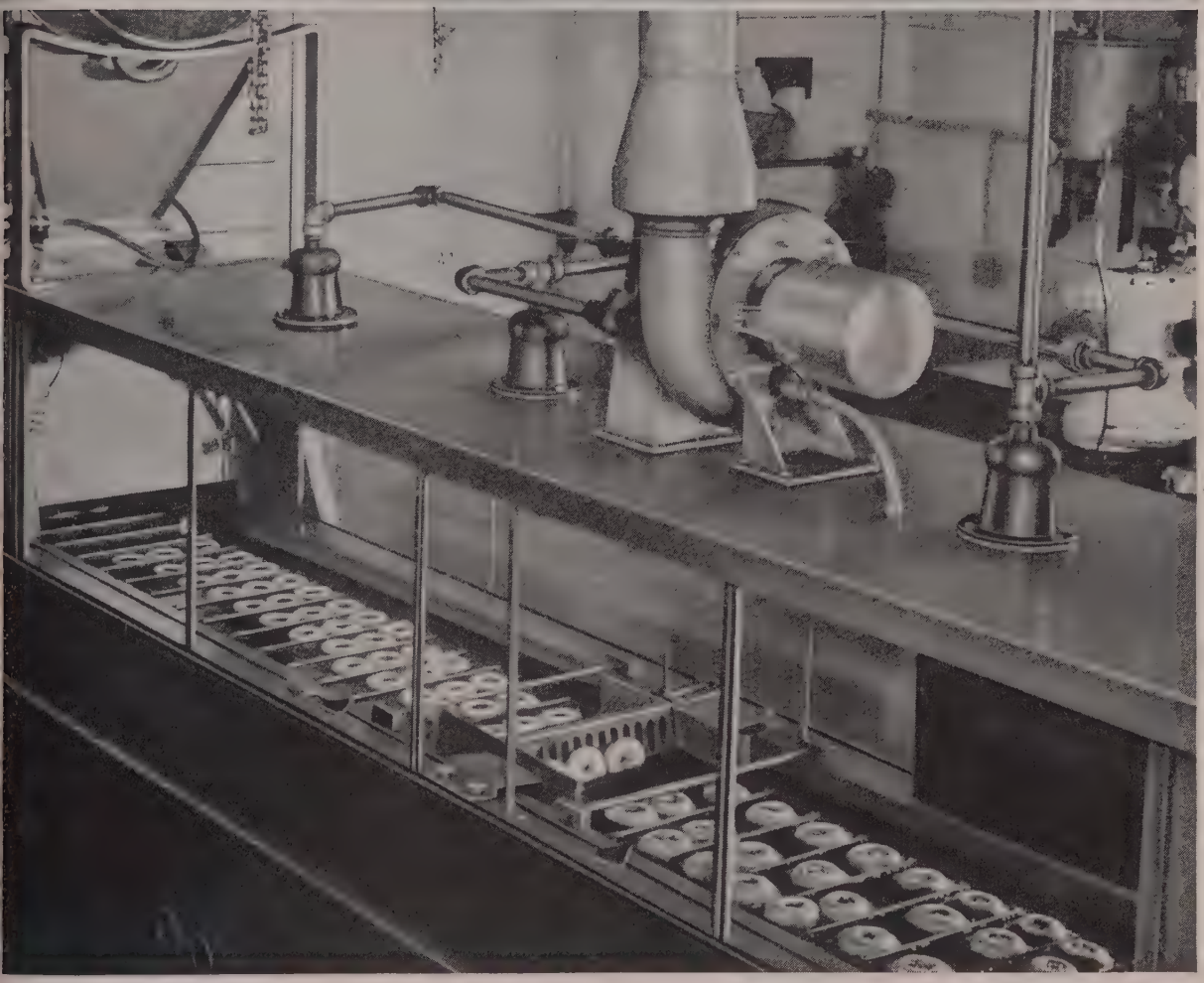
After dropping into the chute, the pinions are picked up one at a time, by automatic adaptors (which act as arbors), shaved and ejected into the exit chute—all automatically. The illustration shows one of the pinions in shaving position, the guard having been removed from the underpass shaver to show the entire mechanism.

Check No. 7 on Reply Card for more Details

Flash Trimmer

Morton Mfg. Co., Broadway and Hoyt, Muskegon Heights, Mich., is announcing two flash trimming machines, one for small motor frames and other cylindrical parts and the other for strip stock, bicycle rims or other cylindrical parts. Capacity in removing the flash or upset from

It's DOUGHNUTS to DOLLARS...



—fire won't live long here!

Ever watch doughnuts cooking to just the right shade of rich, tempting brown? Appetizing, isn't it? But . . . the job calls for hot oil—and every housewife knows that's one of the meanest of fire hazards.

The insurance company recommended CO_2—that's why Swans Bakery in Knoxville came to Kidde for an extinguishing system that would smash the threat of fire in doughnut baking machinery. If the hot oil flashes into flame, the *Kidde** system, *instantly* and *automatically*, shoots fast-acting carbon dioxide (CO_2) through Multijet Nozzles into the machine that bakes the flaky doughnuts. That's the end of the fire! And, of course, the dry, clean CO_2 *can't* damage the machine or spoil its contents. The doughnuts just go right on cooking!

You may never bake a doughnut in *your* plant—but you may have fire hazards that are every bit as tricky. Just ask a Kidde representative what to do about them!

When you think of CO_2, call Kidde!

*Also known as "LUX."

The words "Kidde" and "Lux" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

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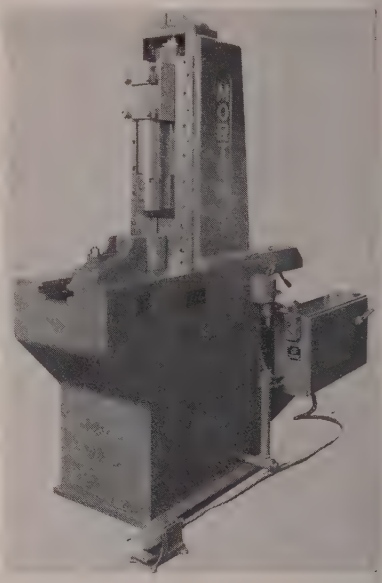
Kidde

butt welded is 4½ inches minimum to 9 inches maximum diameter, with 8-inch length of stroke and stock thickness up to ¼-inch maximum. Base of machine contains the hydraulic fluid and operating valves. Cutting speed of 50 feet and a return speed of 100 fpm is provided.

Latter machine removes flash or upset from strip stock or cylinders up to 4 inches maximum width and



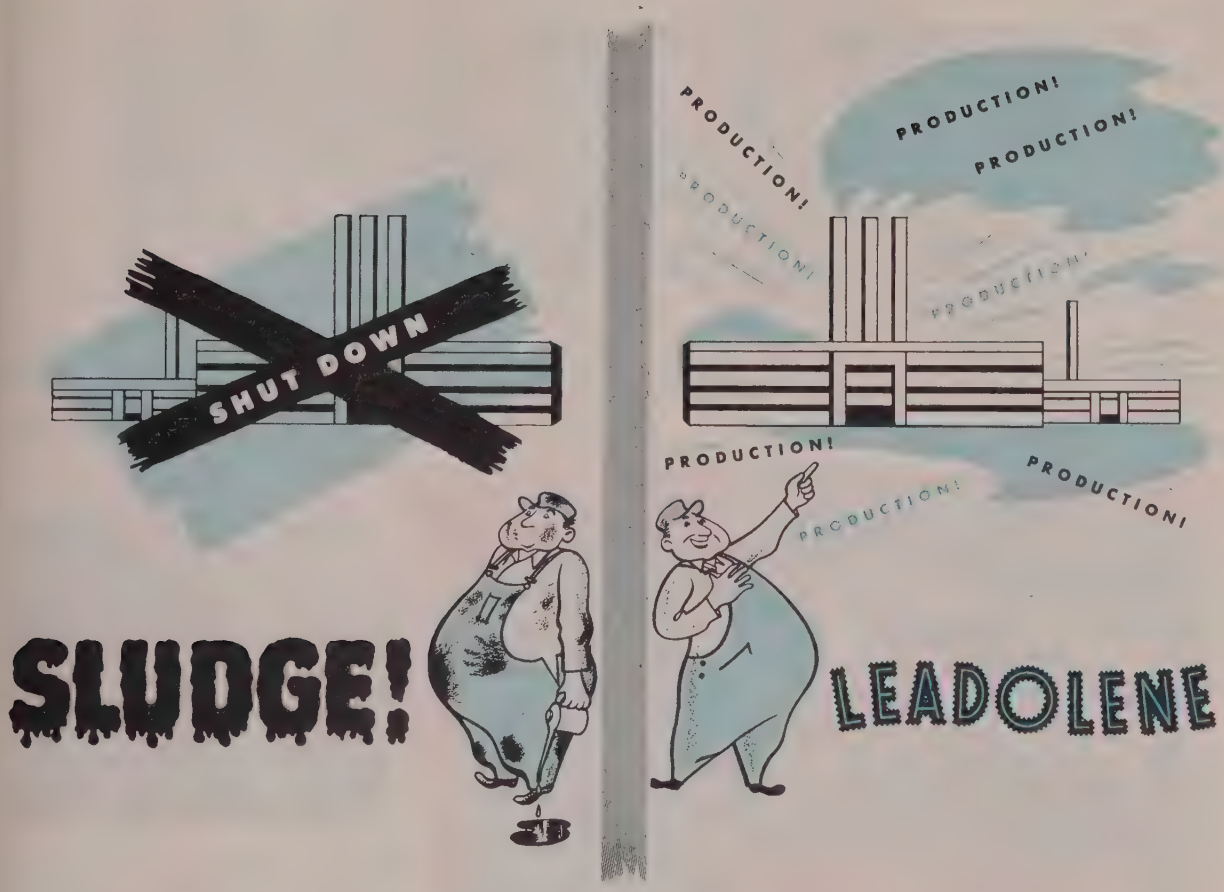
3/32-inch maximum thickness. Lower housing of machine is machined on the upper surface to form the guiding ways for the movable cylinder. Rams are made of steel forgings and machined to a T-shape. Constant cut and return stroke is provided. Provisions are made for shortening the total length of ram travel. This trimmer is automatic in its operation.

Check No. 8 on Reply Card for more Details

Steam Generators

Generating 45 pounds of steam per hour, the Speedylectric line of electrode steam generators, designed by Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass., have a capacity great enough to serve a two-platen heavy-duty compression molding press with a platen size of 2 x 20 x 30 inches on a straight heat cycle. Operating on 220 volt, single phase power, the units, which measure 14 x 21 x 35 inches, are offered in pressure ranges of 100, 200 and 250 pounds per square inch gravity.

Known as series No. 512-1½ boilers, they have other applications in addition to plastic molding, such as heating of rubber rolls, glue pots and laboratory presses. The units are readily portable, weighing less



RECORDS SHOW *NO SLUDGING IN FIFTEEN YEARS* WITH

BROOKS LEADOLENE

Sludging—that's the quick, easy way to give any mill man gray hairs. And at the first sign of sludging, take a look at your pinions and gears. You'll see signs of pitting, cutting and excess wear. At this point you will need the skill and experience of the Brooks engineer. He will show you how "LEADOLENE", with its "Indestructible pH-ilm" will stop this excessive wear, pitting and sludging. As a matter of fact, in many instances you can continue using these damaged gears and pinions for years without replacing.

"LEADOLENE" always stays neutral—never becomes acid. Being unaffected by water, wear or sludging—make-up costs are negligible. Keep your mill at top production—change to "LEADOLENE" NOW!

The Brooks Oil Co.

**LEADOLENE . . . the "I.P. Lubricant" ("Indestructible pH-ilm") . . . for Industrial Needs*

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Warehouses: In Principal Industrial Cities

than 100 pounds. Heat is generated by the resistance of the boiler water to the flow of current between solid metal electrodes. If there is no water in the boiler, no current flows and the power input stops.

Check No. 9 on Reply Card for more Details

Automatic Transmission

Made to supplement or replace two-speed motors and providing a broader range of speed, the two-speed automatic transmission announced by Western Mfg. Co., 3400 Scotten Ave., Detroit 10, Mich., has the additional advantage of having special ratios available. The mechanism consists of two over-running clutches, one engaging in a clockwise and the other in a counter-clockwise direction, so arranged that by merely reversing the motor, two speeds are provided, one at a 1.1 ratio and the other at a preselected reduction. These speeds are provided on the output shaft without changing its direction of rotation.

Reversing operation is accomplished by a pushbutton, limit or timing switch. Two-speed transmissions are built to handle 5, 10, 15, 20, 25 and up to 50 horsepower motors. In the 5 horsepower model with a 1750 rpm input, the low limit is a reduction of 6.31 to 1 but any preselected ratio from 1.1 to this low limit is obtainable.

Check No. 10 on Reply Card for more Details

Cord Trolleys

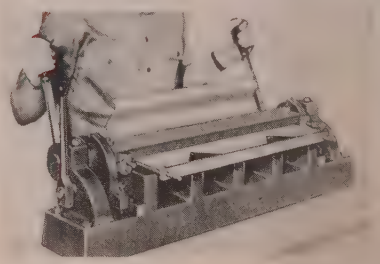
Electric current may be supplied to hoists and other mobile equipment operating on monorail tracks by the Budget conductor cord trolleys, announced by Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore Inc., Muskegon, Mich. The conductor cord is suported by the trolleys on

the same track on which the hoist is installed. It permits the supporting of cords around curves on monorail tracks. They will go through the same switches as the hoist trolley. It is practical to use this method of supplying current to hoists for tracks as long as 175 feet in which there are curves and switches.

Check No. 11 on Reply Card for more Details

Radius Forming Brake

Engineered for the forming of duraluminum, chrome molybdenum and other materials of low ductility which would fracture if formed to a sharp "no radius" bend, the new radius



forming brake, announced by O'Neil-Irwin Mfg. Co., Eighth Ave., Lake City, Minn., has a capacity of 24 inches in 16-gage sheet steel. This No. 4 brake eliminates the possibility

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BAKER'S MAGDOLITE is the original Dead-Burned Dolomite . . . preferred throughout the industry. Furnace bottoms protected with this superior refractory produce uniform ingots in greater numbers at lower fuel costs with less defective material. That is the experience of open hearth and electric furnace men. That can be your experience, too. Write for the facts on BAKER'S MAGDOLITE.

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1-49

of fracture or disintegration developing at the line of forming. Case hardened and spring tempered materials that must be formed after heat treating can also be safely worked to accurate dimension.

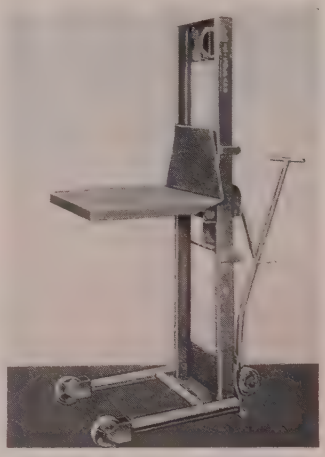
Degree of forming is 125 degrees. Radii obtainable with standard forming bars are 0, 1/16, 3/32, ⅛, 5/32, 3/16 and 7/32-inch. Angularity of all bends is accurately controlled by adjustable angle degree stops. Two different positions allow operator choice for both convenience and greater production in forming. It is equipped with Torrington roller bearings.

Check No. 12 on Reply Card for more Details

Portable Stacker

Loads up to 500 pounds may be raised and lowered within the capacity of the easily movable model DH Handy Hoister, made by Lewis-Shepard Products, Inc., 280 Walnut St., Watertown 72, Mass. It may be used in the shop or warehouse as well as in the loading and unloading of street trucks. Crank-up and crank-down operation through planetary gear drive winch permits placing and holding platform at any level. Winch handle cannot spin or get away from operator when lowering the load.

Wheels and sheave run on roller bearings. Platform of heavy gage reinforced sheet steel rolls on guide wheels equipped with ball bearings



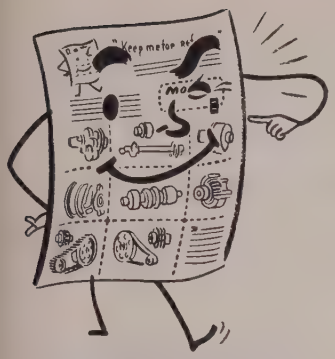
and safety guards. Its open-end base straddles machines or other obstacles. The hoist is held firmly to the floor except when the steering handle is pulled forward to move it. It has a 24 x 24-inch lifting platform, 5½-inch lowered height, 58-inch lifting height and 72-inch overall height.

Check No. 13 on Reply Card for more Details

Sheet Grinding Machine

Adjustable to any length sheet up to 144 inches and travelling at 58 lineal feet per minute, the carriage of the No. 27-K sheet grinding and polishing machine, designed by Excelsior Tool & Machine Co., 3100 Ridge Ave., East St. Louis, Ill., is operated by a reversible motor, stopping automatically at end of stroke and raising rubber pressure roller so polished sheet can be removed. The mechanically operated machine can be located on any floor, no concrete foundation being necessary. Grinding belt can be removed and replaced in 5 minutes. All mechanically controlled adjustments are operated from the same location.

Machine carriage cannot overtravel, thus preventing damage to grinding belts or rubber contact roller on which any pressure from 200 to 600 pounds may be applied by removable hand weights. The motor is directly connected with V-belts to the driving pulley on the polishing head. Front drum is adjustable to take care of



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Here's your quick reference file for Morse Mechanical Power Transmission Products

As a purchasing engineer, design engineer or maintenance man — here's help in getting the best in mechanical power transmission. In making your choice, use this handy check list of the basic Morse Chain line—the finest mechanical power transmission products available.

There are 20 Morse branches capable of giving expert engineering counsel on power transmission problems.

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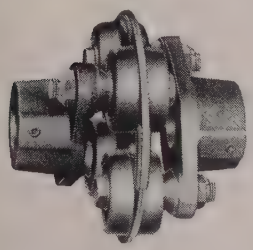
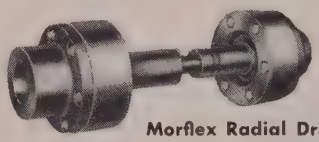
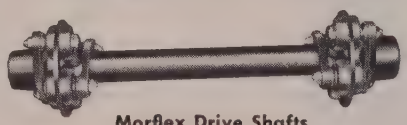


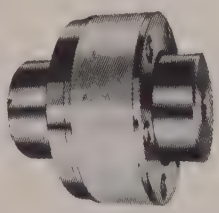
Morflex Couplings



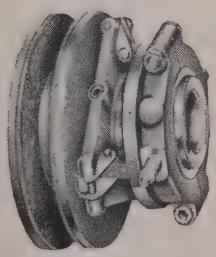
Morflex Radial Drive Shafts



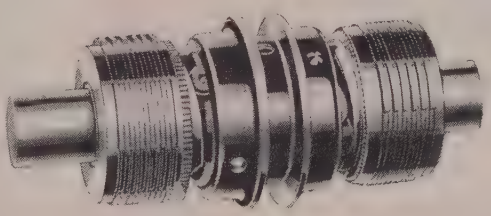
Morflex Drive Shafts



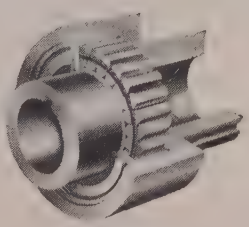
Morflex Radial Couplings



Morse-Rockford Over-Center Friction Clutches



Morse-Rockford Pullmore Clutches

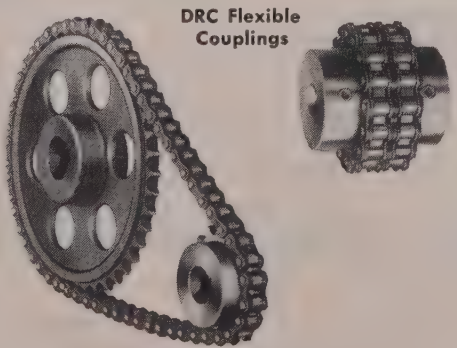


Morse-Formsprag Over-Running Clutches

DSC Flexible Couplings

Silent Chain Drives

DRC Flexible Couplings



Roller Chain Drives

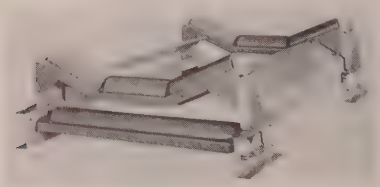
NOTE: **Distributors—there's one near you—carry stocks from which quick deliveries can be made. Write Dept. 327, Morse Chain Company, 7601 Central Avenue, Detroit 8, Mich., for further information about any or all products.**

grinding belt length variations. Grinding belt speed is 3500 surface feet per minute. As excess pressure will discolor and buckle light gage sheets, friction temperature is reduced by applying a lubricant to the sheets.

Check No. 14 on Reply Card for more Details

Belt Conveyors

Idlers of belt conveyor systems made by Transall Inc., 109 N. 11th St., Birmingham 4, Ala., are lubricated with nonoxidizing, nonemulsifying lubricant which retains its viscosity through a wide range of tem-



peratures. This lubricant is sealed in and will not throw out to cause damage to the belt. The combination of ball bearings and this lubrication eliminates cold morning starting troubles. Mounting of each roll is of Neoprene which cushions, eliminates bearing shock and reduces vibration as well as providing automatic self-alignment of bearings.

Conveyors as a whole have such features as minimum heights of head section, main chassis and tail section; spill shields to protect the belt; compact drive and power unit; self-cleaning tail pulley; and short, maneuverable, tail section. Conveyor is suited to installations where it has to be moved frequently, as it does not rely on permanent support structures. They may be extended to any reasonable length.

Check No. 15 on Reply Card for more Details

Floor Truck

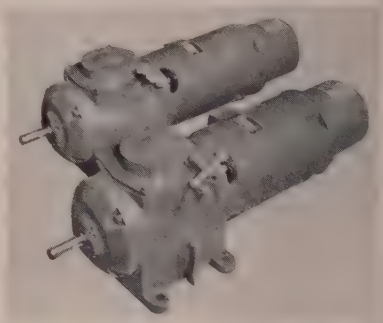
With a maximum capacity of 2500 pounds distributed load, the Load Carrier Junior industrial floor truck, made by Market Forge Co., 25 Garvey St., Everett, Mass., is furnished in tilt, nontilt, wagon and dolly types. Truck is 30 inches wide and has 60 inches of loading space between end racks. Overall length is 63⅝-inches.

Wheels can be furnished of semi-steel, aluminum, cushion rubber, hard rubber and plastic in 4, 6 and 8-inch diameters. Standardized accessories normally used on the Load Carrier such as end racks, pipe stakes, box sections, shelves, leaf trucks, cradle units, and rod and tube units may be used.

Check No. 16 on Reply Card for more Details

Variable Speed Drives

Added to the line of variable speed transmissions produced by Graham Transmissions Inc., 3754 N. Holton St., Milwaukee 12, Wis., are two



units, both with built-in motors. Model 41M is equipped with built-in Stearns magnetic brake. Illustrated here, it is for application on machines requiring instant stoppage when the motor power is shut off,

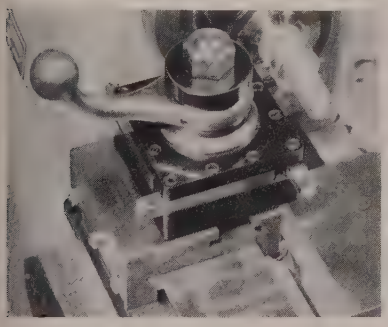
together with a choice of infinitely variable speeds from top to zero.

Model 41MW has a built-in worm reducer and is offered in ratios of reduction of 5:1, 12:1, 18:1, 27:1 and 54:1. The gear box may be fastened to the transmission housing to give horizontal position of the slow speed shaft, either left or right; or the output shaft may project vertically either upward or downward. The heavy cast iron construction of the main transmission housing provides rigid mounting of this unit through four supporting bolts.

Check No. 17 on Reply Card for more Details

Indexing Turret

An automatic indexing square turret is announced by Hardinge Brothers, Inc., Elmira, N. Y., for application directly to the tool post T-slot of the compound slide on that company's precision lathe. The turret takes four



standard 5/16-inch square tool bits. Accurate indexing is accomplished through a hardened and precision ground tapered index pin which locates in mating hardened and precision ground stations.

Turret indexes rapidly by a simple movement of the ball handled lever. Moving the lever, the turret is automatically unlocked, indexed to the next tool position and relocked, ready for the next machining operation.

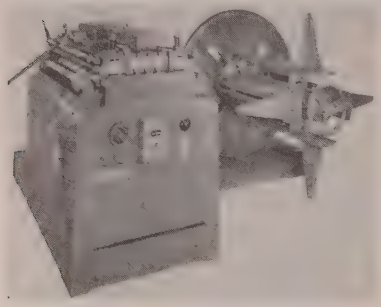
Check No. 18 on Reply Card for more Details

Straightening Machine

To affect savings in space, F. J. Littell Machine Co., 4165 Ravenswood Ave., Chicago 13, Ill., has combined a No. 438-7PD continuous straightening machine with a No. 60-36 automatic centering reel on a common base measuring 72 inches wide and 90 inches long. Design details of the straightening machine include pinch rolls 4¼ x 38 inches with one set on each end. The 7-roll straightener has rolls 2¼ x 38 inches long. Upper straightening rolls are ball bearing equipped and lower straightening

rolls are power driven. Machine is arranged with a 4 to 1 variable speed, 5 horsepower drive, to give speed of 225 to 900 fpm.

The automatic centering spindle type reel is not motor driven. It is mounted in slots so that it can be



adjusted forward or backward in relation to the straightening machine. Coil capacity is 6000 pounds, up to 36 inches wide, with an inside diameter of 16 to 20½ inches.

Check No. 19 on Reply Card for more Details

• • •

TAP HOLDER: A floating-releasing tap holder, announced by Empire Tool Co., Detroit 13, Mich., corrects for parallel and angular misalignment to assure accurately tapped holes and will not bind or freeze under tension or compression. It will float tap out of hole freely.

Check No. 20 on Reply Card for more Details

SWIVEL HANGER: Type SSH safety swivel hanger for industrial lighting installations, offered by Appleton Electric Co., Chicago 13, Ill., is furnished complete with cover and is for use with 1½ to 4-inch deep concrete boxes as well as 4-inch octagonal boxes measuring 1½ or 2⅛-inch deep.

Check No. 21 on Reply Card for more Details

AIR-OPERATED CLAMP: Known as DTAO-400, a toggle-action, air operated clamp, offered by Lapeer Mfg. Co.; Lapeer, Mich., is intended for use where a clamping support would be inconvenient for efficient production. Operating air pressure is 85 pounds.

Check No. 22 on Reply Card for more Details

LIMIT STOP: A new limit stop for control of ½ and 1 ton Reading electric hoists is available from Reading Chain & Block Corp., Reading, Pa.

Check No. 23 on Reply Card for more Details

SMOKE CONTROL: Brooke Engineering Co. In- Philadelphia 22, Pa., adapted their Electric Eye smoke indicators to control over-fire air to prevent smoke in coal burning furnaces. Timer is adjustable from 20 seconds to 20 minutes.

Check No. 24 on Reply Card for more Details

VOLTAGE TESTERS: Two new voltage testers, one designed for high frequency alternating systems and the other for low voltage systems, are announced by Square D Co., Detroit, Mich.

Check No. 25 on Reply Card for more Details

MOUNTINGS: Lord Mfg. Co., Erie, Pa., has developed a new line of holder type vertical snubbing mountings designed to isolate vibration and control severe shock. Load capacity is from 120 to 310 pounds per mount. Series 279 has a deflection limit of ⅛-inch under load; series 281, 3/16-inch; series 282, ¼-inch.

Check No. 26 on Reply Card for more Details

TUBE FITTING: Triple-lok, a new tube fitting developed to meet the new standards set for hydraulic circuit connections on production machinery, is announced by Parker Appliance Co., Cleveland 12, O. Made in steel with dryseal pipe threads and with 37 degree flare angle, fitting will be identified by black nuts and sleeves with cadmium-plated body.

Check No. 27 on Reply Card for more Details

RECORDER: Development of a new instrument for recording time-in-process is announced by Bristol Co., Waterbury, Conn. It gives a reading on a uniform scale and chart of rate of conveyor movement, directly in terms of total time consumed by work traveling through a process.

Check No. 28 on Reply Card for more Details

TAPE: A paper tape with a tensile strength of 180 pounds per inch of width is offered by Minnesota Mining & Mfg. Co., St. Paul. Designated as No. 320 in the Scotch brand line, it has a pressure sensitive adhesive which grips immediately upon contact.

Check No. 29 on Reply Card for more Details

FIRING UNIT: A new, complete gas combustion assembly, called the Gas Pak, for the automatic firing of many different types of heating equipment is offered by Eclipse Fuel Engineering Co., Rockford, Ill.

Check No. 30 on Reply Card for more Details

DUST HOOD: Loose fitting dust hoods, weighing only 5 ounces are available from General Scientific Equipment Co., Philadelphia 32, Pa. Fabric, supported by a head frame, covers and protects the face, head and neck down to the shoulders. May be worn with goggles or respirator.

Check No. 31 on Reply Card for more Details

DRILLING HEAD: An adjustable drilling head, offered by Errington Mechanical Laboratory Inc., Staten Island 4, N. Y., permits user to take advantage of a wide range of adjustment without overhang. It can be supplied with two to six spindles and drills from 0 to 1½-inches.

Check No. 32 on Reply Card for more Details

STARTER: A new, self-powered, friction-drive starter for diesel or gas engines is announced by White Roth Machine Corp., Lorain, O. It is powered by an air-cooled, single cylinder gasoline engine with four brake horsepower output.

Check No. 33 on Reply Card for more Details

METAL CABINET: A new steel cabinet with rustproof aluminum drawers for storage of small items such as nails, screws, nuts, bolts, washers, small parts, etc., is available from Kaytee Products, Canton, O.

Check No. 34 on Reply Card for more Details

PUMP: For the industrial handling of liquids, Eco Engineering Co., Newark 1, N. J., offers a gearless pump with a new dual eccentric piston design. It is available in four sizes, ¼, ⅜, ½ and ¾-inch and capacities ranging from 1 to 12 gallons per minute.

Check No. 35 on Reply Card for more Details

FLOOR MACHINE: An explosion-proof floor machine for automatic scrubbing, cleaning and polishing of hazardous areas has been developed by Multi-Clean Products Inc., St. Paul 1, Minn. Designated as MC-EX, the dual alternating current 110 or 220 volt capacitor induction type motor is ⅓-horsepower for the 14-inch machine and ¾-horsepower for the 16-inch machine.

Check No. 36 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

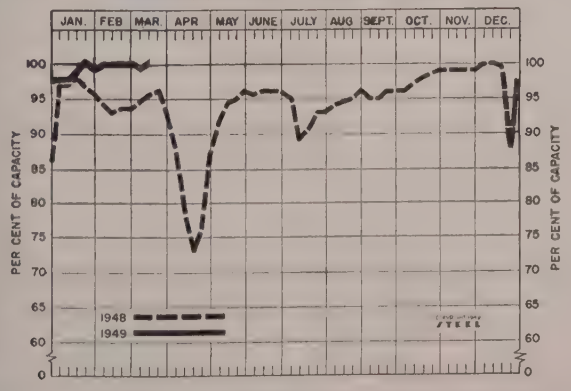
CONSUMER pressure for downward adjustments in steel prices is mounting in step with shrinking demand. Except for the fading out of premium prices and sharp reductions in gray market quotations, however, nothing has yet developed to indicate any industry-wide retreat from established schedules is in early prospect. In fact, some sellers are considering upward adjustments in certain extras to compensate for continued rising production costs.

PRICES— Whether the steelmakers can long resist the pressure for reductions is debatable. Pressure is being exerted by both large and small consumers, including important automotive accounts. This has given rise to a degree of uneasiness with respect to prices not experienced since before the war, and should the hoped-for spring upturn in business fail to materialize it is believed some sellers may be tempted to give way. As of the moment, some sellers think a reduction at this time might be a smart move in view of easing demand; that it might hasten readjustment and give business a fresh start. Also, it might strengthen the position of the mills in labor negotiations later. Others, however, are inclined to move slowly, withholding any action pending clearer appraisal of future demand.

PREMIUMS— Meanwhile, premium prices appear to be fading rapidly. Last week a large eastern producer cut prices $3 to $6 per ton on galvanized wire products, restoring its schedule in line with those of other makers. Another wire producer, in New England, withdrew its base price on manufacturers wire, while still another premium-price interest has adjusted its schedule on wire products in line with competitors. There have been a number of warehouse price adjustments, including a cut of $4 per ton on cold-rolled strip by a Cleveland jobber who also is considering a reduction on cold-finished bars. It also was reported premium prices on stainless steel have disappeared, sellers that had been quoting 10 per cent above the regular market having rescinded advances initiated some time back. Scrap prices continue weak in the absence of active demand and steel mill grades have been marked down $4 at Birmingham, $2 at Pittsburgh and $2 to $2.50 at Seattle. The only upward change in prices noted last week involved ferromanganese which was advanced $12 per ton by several producers.

DEMAND— Seasonal influences to date have failed to check the downward trend in buying. Some leading steelmakers assert that, if anything, there has been an acceleration in the decline since the opening of the month, with such major items as tin plate, sheets, plates, shapes and bars all being adversely affected. Most wire products are in easier supply, to say nothing of stainless steel and alloys generally. Sellers are hopeful that once spring gets under way there will be at least a leveling off, if not a turn for the better. Up to now, however, the easing has been increasingly pronounced. Cancellations have been increasing and while the mills have been able to divert cancelled tonnage, holes are opening in rolling schedules with much greater frequency. Even sheet demand is tending toward the spotty side and at some consuming points where supply shortages have been extremely acute, such as the West Coast, a definitely easier condition now prevails. Some buyers are holding back orders in anticipation of markedly improved supply conditions over coming months due to cutbacks in mill allotments to preferred accounts. Railroad car builders' requirements, for example, are reported being cut back and some trade predictions are that present voluntary steel allocations for cars may be cut as much as 50 per cent before the end of second quarter. Railroad car orders have fallen off markedly. Overall cut in voluntary allocations is expected to run as high as 25 per cent of the total tonnage, which now stands in excess of 560,000 tons monthly.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended March 12	Change	Same Week 1948	Same Week 1947
Pittsburgh	98	+ 3.5	96	95.5
Chicago	99.5	— 0.5	94	95.5
Eastern Pa.	98.0	+ 1.0	92	88
Youngstown	105	None	103	91
Wheeling	95	+ 3.0	92.5	89
Cleveland	102	+ 2.5	95.5	94
Buffalo	104	None	101	90.5
Birmingham	100	None	100	99
New England	87	None	85	94
Cincinnati	99	— 7	106	91
St. Louis	82.5	None	77.5	74.5
Detroit	103	None	104	90
Western	100.5	....	..	..
Estimated national rate	100.5	+ 1	..	..

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947.

News Summary—P. 55 *Engineering News—P. 85*

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Mar. 12	Mar. 5	Month Ago Feb. 1949	Year Ago Mar. 1948	5 Years Ago Mar. 1944
Finished Steel	$97.77	$97.77	$97.77	$81.14	$56.73
Semifinished Steel	75.75	75.75	75.75	68.72	36.00
Steelmaking Pig Iron	46.22	46.22	46.22	39.34	23.00
Steelmaking Scrap	36.33	37.33	38.48	40.21	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Feb. 1949	4.20580c
Jan. 1949	4.20580c
Dec. 1948	4.20208c
Feb. 1948	3.54374c
Feb. 1944	2.38787c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods, on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. January and February, 1949, figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	March 12, 1949	Feb. 1949	Dec. 1948	Mar. 1948
Steel bars, Pittsburgh mills	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia	3.8164	3.8164	3.79	3.356
Steel bars, Chicago mills	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills	3.275	3.275	3.275	2.80
Shapes, Chicago mills	3.25	3.25	3.25	2.80
Shapes, del. Philadelphia	3.4918	3.48	3.48	2.968
Plates, Pittsburgh mills	3.50	3.50	3.50	2.95
Plates, Chicago mills	3.40	3.40	3.40	2.95
Plates, del. Philadelphia	3.7256	3.7256	3.71	3.19
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.95
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	3.95
Strip, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	3.05
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.80
Bright basic, wire, Pittsburgh	4.325	4.325	4.325	3.775
Wire nails, Pittsburgh mills	5.775	5.775	5.775	5.20
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$6.80	$6.80

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$60.00
Slabs, Chicago	52.00	52.00	52.00	45.00
Rerolling billets, Pittsburgh	59.00	59.00	59.00	45.00
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.775c	3.775c	3.775c	3.175c

* Nominal. † 1.50 lb coating.

Pig Iron

	March 12, 1949	Feb. 1949	Dec. 1948	Mar. 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$40.996
Basic, Valley	46.00	46.00	46.00	39.00
Basic, eastern del. Philadelphia	50.3002	50.3002	50.17	42.004
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	40.496
No. 2 fdry., del. Philadelphia	50.8002	50.8002	50.67	42.504
No. 2 foundry, Chicago	46.25	46.25	46.25	39.00
No. 2 foundry, Valley	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham	43.38	43.38	43.38	37.88
Southern No. 2 del. Cincinnati	49.43	49.43	49.09	41.857
Malleable, Valley	46.50	46.50	46.50	39.50
Malleable, Chicago	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	55.00
Ferromanganese, f.o.b. Etna, Pa.	163.00	163.00	163.00	151.00*

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$37.00	$40.00	$42.75	$40.25
Heavy melt. steel, No. 2, E. Pa.	33.75	35.69	41.50	39.00
Heavy melt. steel, No. 1, Chicago	34.00	35.75	41.75	38.875
Heavy melt. Steel, No. 1, Valley	37.75	37.75	42.75	40.25
Heavy melt. steel, No. 1, Cleveland	35.25	37.25	42.25	39.75
Heavy melt. steel, No. 1, Buffalo	38.75	40.50	48.50	44.00
Rails for rerolling, Chicago	45.75	48.19	70.38	49.625
No. 1 cast, Chicago	41.50	44.25	70.50	66.00

Coke

Connellsville, beehive furnace	$14.50	$14.50	$14.50	$12.50
Connellsville, beehive foundry	17.00	17.00	17.00	14.875
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.25

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-$105 per gross ton. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $62, Conshohocken, Pa.; $66. Monessen, Pa.; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c Monessen, Pa. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Aliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill., 5.10c, Williamsport, Pa.; another interest quotes 5.35c, mill.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford.

High-Strength, Low-Alloy Bars: 5.10c, mill, except 5.30c, Youngstown; 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; another interest quotes 5.35c, mill.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O.; 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren, O.; 6.05c, Niles, O.
Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.; 6.55c, Niles, O.
Motor: 6.70c mill except: 6.90c, Granite City, Ill..; 7.20c, Warren, O.
Dynamo: 7.50c, mill, except: 7.70c, Granite City, Ill.
Transformer 72, 8.05c, mill, except: 9.15c, Follansbee, W. Va., Toronto, O.; 10.05c, Brackenridge, Pa.; 65, 8.60c, mill, except: 9.85c, Follansbee, W. Va., Toronto, O.; 10.60c, Brackenridge, Pa.; 58, 9.30c, mill except: 10.55c, Follansbee, W. Va., Toronto, O.; 11.30c, Brackenridge, Pa.; 52, 10.10c, mill, except: 11.35c, Follansbee, W. Va., Toronto, O.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.
Galvanized (No. 10), 6.75c, mill.
Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

* Wider than 6-in. and 6-in. narrower, respectively.

Cold-Rolled Strip (0.25 carbon and less); 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $6.45-6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala., Sparrows Point, Md.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.10c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Youngstown.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa.; Minnequa, Colo., Atlanta, Buffalo; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer quotes 4.15c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md.; 4.95c, Monessen; Pa.; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Portsmouth, O., Aliquippa, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlata; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109, Worcester, Mass.; 110, Minnequa, Colo., Atlanta; 123, Pittsburg, Calif.; 124, Cleveland; 126, Monessen, Pa.; $6.75 per 100 pound keg, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 103, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 113, Monessen, Pa., Kokomo, Ind.; 116, Minnequa, Colo.; 121, Atlanta; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126, Atlanta; 128, Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

Fence Posts (with clamps): Col. 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113 Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301	28.50-28.75	30.50-32.00	37.50-40.75
302	28.50-28.75	33.00-33.75	37.50-40.75
303	31.00-31.50	36.50-39.75	39.50-43.00
304	30.00-31.25	35.00-35.75	39.50-43.00
316	46.00-48.00	55.00-57.25	53.00-57.25
321	34.00-34.75	44.50-45.75	45.50-49.00
347	38.50-39.75	48.50-50.25	50.00-54.00

STRAIGHT CHROMIUM STEELS

410	22.75-23.00	26.50-27.00	32.00-33.00
416	23.25-23.50	28.25-33.50	32.50-33.50
430	23.25-23.50	27.00-27.50	34.75-35.50
446	32.50-33.00	60.00-62.25	46.50-50.00

STAINLESS-CLAD STEELS

	Plates —Cladding— 10%	Plates —Cladding— 20%	Sheets —Cladding— 10%	Sheets —Cladding— 20%
302	....	....	19.75	21.50
304	22.50	26.50	20.75	22.50
310	32.50	36.50	....	....
316	27.00	31.00	26.00	28.00
321	23.50	27.50	....	....
347	25.00	29.00	24.00	26.00
405	18.75	24.75	....	....
410	18.25	24.25	....	....
430	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton. Discounts from base follow:

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	39½-	8½-	1	46-	25-
	41½	12½		48½	27½
¼	37½-	9½-	1¼	46½-	25½-
	39½	14		49	28
⅜	34-	4½-	1½	47-	26-
	36	9		49½	28½
½	40½-	18-	2	47½-	26½-
	43	21½		50	29
¾	43½-	22-	2½, 3	48-	27-
	46	24½		50½	29½
			3½ & 4	44½	22½

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	39½	17½	38½	16½	27-	5-
					38½-	17
2½	42½-	20½-	41½	19½	32½-	10½-
	43½	21½			41½	20
3	42½-	20½-	41½	19½	35-	13-
	43½	21½			41½	20
3½ &4	42½-	20½-	43½	21½	38½-	16½-
	46½	24½			43½	22
5 & 6.	42½-	20½-	43½	21½	38½-	16½-
	44½	22½			43½	22
7	....	....	....	....	43½	20½

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	40½	....	1¼	46-	26-
¼	38½	....		48	27
⅜	35	....	1½	46½-	26½-
½	40-	18½-		48½	27½
	42	19½	2	47-	26½-
¾	43-	22½-		49	28
	45	23½	2½ & 3	47½-	27-
1	45½-	25½-		49½	28½-
	47½	26½-	3½ & 4	43½	....

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	38½	16½	37½	15½	26-	4-
					37½	16
2½	42½	20½	40½	19½	31½-	9½-
					40½	19
3	42½	20½	40½	19½	34-	12-
					40½	19
3½-4	41½-	20-	42½	20½	37½-	15½-
	45½	23½			42½	21
5 & 6.	41½-	20	42½	20½	37½-	15½-
	43½				42½	21
8	45½	....	44½	21½-	40½-	17½-
				22	44½	22
10	45	....	44	21-	41½-	18½-
				21½	44	21½
12	44	....	43	20-	40½-	17½-
					43	20½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Lap Weld Blk.	Lap Weld Gal.
⅜	+59½	+95½	1¼	+22	+53
½	+20½	+52½	1½	+15½	+45½
¾	+10½	+41½	2	+ 7½	+36½
1 and			2½-3½	+ 5	+32
1¼	+ 4½	+32½	4	List	+26
1½	—1½	+29	4½-8	+ 2	+27½
2	— 2	+28½	9-12	+12	+37

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24', inclusive.

O.D. B.W. In.	Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	.....	13.39-14.64	13.00	13.00
1¼	13	.....	15.87-17.34	13.21	15.39
1½	13	16.45	17.71-19.35	14.60	17.18
1¾	13	18.71	20.15-22.02	16.60	19.54
2	13	20.96	22.56-24.66	18.60	21.89
2¼	13	23.36	25.16-27.50	20.73	24.40
2½	12	23.54-25.73	27.70-30.28	22.83	26.88
2½	12	25.79-28.19	30.33-33.15	25.02	29.41
2¾	12	27.33-29.87	32.14-35.13	26.51	31.18
3	12	28.68-31.35	33.76-36.90	27.82	32.74
3¼	11	33.39-36.50	39.29-42.95	32.39	38.11
3½	11	35.35-39.19	42.20-46.13	34.78	40.94
4	10	44.51-48.65	52.35-57.22	43.17	50.78
4½	9	58.99-64.47	69.42-75.88	....	....
5	9	68.28-74.64	80.35-87.82	....	....
6	7	104.82-114.57	123.33-134.81	....	....

Pipe Cast Iron: Class B, 6-in. and over, $98.50 per net ton, Birmingham; $106.70, del. Chicago; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill, except: $3.50, Indiana Harbor, Ind., and Minnequa, Colo.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $5.10 per 100 lb, Williamsport, Pa.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes, 5.35c, mill, except: 5.25c, Pittsburgh.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Philadelphia, del.	50.3002	50.8002	51.3002	51.8002
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.43	....	....
Buffalo, furnace	47.00	47.00	47.50	48.00
Boston, del.	56.20	56.20	56.70	....
Rochester, del.	49.35	49.35	49.85	50.35
Syracuse, del.	50.2065	50.2065	50.7065	41.2065
§**Chicago,** district furnaces ..	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del.	....	51.28-51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Lone Star, Tex., furnace....	50.00	†50.50	....	....
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	52.75	53.25	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace....	47.90	48.40	48.90	....
St. Louis, del.	49.40	49.90	50.40	....
Ironton, Utah, furnace	55.00	55.50	....	....
‡**Neville Island, Pa.,** furnace.	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) .$59.50
6.51-7.00.. 60.75 9.01- 9.50. 67.00
7.01-7.50.. 62.00 9.51-10.00. 68.25
7.51-8.00.. 63.25 10.01-10.50. 69.50
8.01-8.50.. 64.50 10.51-11.00. 70.75
8.51-9.00.. 65.75 11.01-11.50. 72.00
F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $84.75 furnace, Niagara Falls; $84 open-hearth and $85 foundry grade, Keokuk, Iowa. Piglets, Si 16%, $91, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central furnace, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Diam.	Length	Cents per lb, f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace..	$13.50-15.50
Connellsville, foundry..	16.00-18.00
New River, foundry ...	16.50
Wise county, foundry..	15.35
Wise county, furnace..	14.60
Oven Foundry Coke	
Kearney, N. J., ovens.	$22.00
Everett, Mass., ovens. New England, del.‡.	23.35
Chicago, ovens	20.40
Chicago, del.	†21.85
Detroit, del.	24.16
Terre Haute, ovens....	20.20
Milwaukee, ovens	21.15
Indianapolis, ovens ...	20.85
Chicago, del.	24.19
Cincinnati, del.	23.66
Detroit, del.	24.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens..	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del.	22.70
Birmingham, ovens ..	17.70
Philadelphia, ovens ...	21.05
Swedeland, Pa., ovens.	21.00
Portsmouth, O., ovens.	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.75
Flint, del.	22.98
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees ...	23.00-26.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective as of Oct. 1)	
Phenol, 40 (carlots, returnable drums)	13.50
Do., less than carlots	14.25
Do., tank cars	12.50
(Effective as of Oct. 25)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Ahtens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Besemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)

Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% concentrates, contract 16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68% .. 15.00
Brazil iron ore, 68-69% 19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid ..... $26–$2

Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland Oreg., and/or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	37.50
48% 3:1	39.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio .....$25.50-$26.00	
45% no ratio	26.50
48% no ratio 29.00-30.00	
50% no ratio 29.50-30.50	

Brazilian—nominal

44% 2.5:1 lump	$33.60

Rhodesian

45% no ratio .....$27-$27.50	
48% no ratio	30.00
48% 3:1 lump	39.00

Domestic (seller's nearest rail)

48% 3:1	$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines $0.90

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½" & up	H-R Alloy **4140		Carbon ⅜"-¾"	Floor ⅜" & Thicker
New York (city)	5.80	6.76	7.91	5.92	...	5.80	6.61	8.68	5.53	5.90	7.51
New York(c'try)	5.60	6.56	7.71	5.72	...	5.60	6.41	8.48	5.33	5.70	7.31
Boston (city)	6.10	6.70	8.00	6.10	...	5.67	6.42	8.72	5.57	5.95	7.40
Boston (c'try)	5.95	6.55	7.85	5.95	...	5.52	6.27	8.57	5.42	5.80	7.25
Phila. (city)	5.72	6.64	7.53-7.58	5.60	...	5.55	6.34	8.40	5.25	5.53	6.74
Phila. (c'try)	5.57	6.59	7.38-7.43	5.45	...	5.40	6.19	8.25	5.10	5.38	6.59
Balt. (city)	5.46†	6.36	7.26	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)	5.31†	6.21	7.11	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va.	5.80	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse)	5.84-6.00	...	...	5.90	...	5.91-5.95	6.61	...	5.85-5.89	6.05-6.09	7.50-7.54
Buffalo (del.)	5.00	5.90	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85	5.75	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse)	4.85-5.00§	5.75-5.85[8]	7.15	5.00-5.10	5.95-6.00	4.90-5.10	5.65	9.60	4.90-5.15	5.05-5.25	6.55
Detroit (w'hse)	4.85-5.00§	5.75-5.85[8]	7.15	5.00-5.35	5.95-6.00	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.90‡‡	5.90-6.31	7.40-8.10‡‡	5.18-5.31	6.40-6.65	5.32-5.36	6.05	8.24-8.40	5.35-5.62	5.52-5.56	6.95-7.01
Cleve. (w'hse)	4.98-5.75	5.75-6.16	7.25-7.95	5.03-5.16	6.25-6.50	5.17-5.21	5.90	8.24-8.25	5.21-5.47	5.37-5.41	6.80-6.86
Cincin. (w'hse)	5.29	6.14	7.63	5.55	6.10	5.55	6.10	...	5.40	5.64	6.94
Chicago (city)	5.20	5.90‡[8]	7.30	5.00	6.67-6.80	5.05	5.85	8.25[9]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05	5.75‡[8]	7.15	4.85	6.52-6.65	4.90	5.70	8.10[9]	4.90	5.10	6.55
Milwaukee(city)	5.38	6.08‡[8]	7.48	5.18	6.82-6.98	5.23	6.03	8.43[9]	5.23	5.43	6.88
St. Louis (del.)	5.34§	6.24[8]	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. L. (w'hse)	5.19§	6.09[8]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66-6.83	...	5.15	5.40	7.41-7.73[20]
Birm'ham(c'try)	5.05§	...	6.45	5.05	...	5.00	6.51-6.68	...	5.00	5.25	7.26-7.58[20]
Omaha, Nebr.	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.60§	8.05	8.90†	6.80	9.50	6.25	8.20	....	6.10	6.30	8.20
L. A. (w'hse)	6.45§	7.90	8.75†	6.65	9.35	6.10	8.05	....	5.95	6.15	8.05
San Francisco	5.95[21]	7.15	8.05	6.75[21]	8.25[18]	5.90[21]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma	6.35[17]	7.90[5]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[2]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ top level of quoted range is nominal.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. f.o.b. Reg. and Heavy
⅞-in. and smaller	41 off	....
½-in. and smaller	....	38 off
⅝-in.-1-in.	39 off	....
⅞-in.-1-in.	....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6-in. and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

FERROALLOY PRODUCT PRICES

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $62, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $160 per gross ton of alloy, c.l., packed, $172; gross ton lots, packed, $187; less gross ton lots, packed, $204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base Price: $165, Rockwood, Tenn.; $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $160, *Sheridan, Pa.; $163, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $201; less gross ton lots, $218 f.o.b. Chicago. Add or subtract $2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%, respectively.

* Contract price with spot $12 higher. Effective Apr. 1, contract price also will be $172, Sheridan, Pa.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P. 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c, Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, F.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr; c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c- 28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

(*Please turn to Page* 172)

Lower Demand Cuts Lead Price

Retreat of 2.00c from record high is first natural drop in eight years. Until last of 1948, lead had been in shortest supply of all nonferrous metals

New York—Drop of 2c last Tuesday in the price of common lead from its record high emphasized how quickly a tight market can soften. Up to the closing months of 1948, lead had been in shortest supply of all nonferrous metals and the price of 21.50c a pound at New York was an alltime high.

A sudden drop in demand for lead occurred late in December when storage battery makers, who use a third of the lead supply, reduced their requirements. Not only have they continued on this lower basis but other consumers have become price and inventory conscious and have cut their demands for lead.

The 2.00c drop, putting the price at New York at 19.50c and at St. Louis at 19.30c, is the first natural decline in a little more than eight years. Other reduction was an artificial one dictated by the Office of Price Administration. After controls on metals were eliminated in November, 1946, the price rose in steps from 8.25c to the record high of 21.50c a pound, New York. In 1948 alone, the price jumped from 15.00c to the 21.50c level during the period of spirited bidding for the metal.

Battery makers blame their business decline on the East's unseasonably warm weather, which has not taken the usual toll of batteries. Effects of reduced demand from battery makers for lead were accentuated further by heavy imports of the metal that became available when a West Coast dock workers' strike ended.

Meanwhile, the market has been flooded with scrap lead, some reported offered as low as 17.50c.

Work at Mine Back to Normal

New York—Operations at Kennecott Copper Corp.'s mine at Bingham Canyon, Utah, have returned to normal. The mine was closed by a three months' strike ended Feb. 3.

Twenty-four shovels are in operation and about 70,000 tons of ore are being moved daily to mills for processing. Working forces at the mines and mills are back to normal, totaling slightly more than 4000.

Despite strike expenses, the company reported consolidated net income of $93,806,919 in 1948, compared with $91,882,120 in 1947. Between Oct. 24 when the strike started and the end of 1948 the strike caused the loss of 100 million pounds of copper production.

The new copper refinery being built at the company's Utah property and originally planned for refining of only 12,000 tons a month is so constructed that capacity can be increased quickly to 16,000 tons. At the company's Arizona unit, good progress is reported in stripping the orebody preparatory to mining the larger part by the open cut method. Some ore will become available from the pit in the last half of 1949 but it appears it will be the latter part of 1950 before the operation can be stepped up to capacity production of 9 million or more pounds of copper monthly.

Brass—Brass mill business is about 40 per cent below that of a year ago, according to spokesmen of the industry.

Connecticut mills are on a four-day week. They are trying to spread the work, but slackening orders have made layoffs necessary, and more are in sight unless demand improves. The sharp decline in business has occurred since the turn of the year.

Most of the copper demand has been coming from wire mills, these purchases offsetting to some extent the severe drop in brass mill activity. Evidence is mounting, however, that demand for some electrical wire products is tapering off.

Copper—Decline in demand for copper is noted from various classes of consumers, but many buyers have not yet obtained all required for shipment this month and the market, therefore, is considered quite firm. A fair amount of business was transacted in the export market at the unchanged price of 23.50c f.a.s. New York.

Zinc—Order backlogs of zinc smelters at the beginning of March totaled 87,898 net tons, largest since April, 1942, when unfilled orders totaled 98,885 tons. At the beginning of February, 1949, backlogs totaled 75,858 tons.

The increase, it was believed in the trade, resulted partly from postponements in deliveries, partly from undeliverable orders at struck plants, and partly by forward buying.

Because of the shorter month, February smelter production was only 69,193 tons, compared with 75,815 in January. However, February's daily average output was 2471 tons, against 2446 in January.

Tin—Shipments of Straits (Malayan) tin during the first two months of 1949 were double those of the corresponding period of last year, and the tonnage coming to the United States was three times greater than in the first two months of 1948. Straits total shipments in January and February were 13,060 tons, compared with 6255 in those months last year. Of these shipments the United States got 10,600 tons in 1949, against 3550 in the first two months of 1948.

Magnesium—Shipments of magnesium wrought products in January totaled 581,000 pounds, 20 per cent below the 728,000 pounds shipped in December but nearly double the 314,000 pounds moved in January, 1948, according to the Bureau of the Census.

Aluminum—Primary aluminum production in the United States in January totaled 106,713,329 pounds, the Aluminum Association reports. This is about 2 million pounds, above the average monthly output during the fourth quarter of 1948. However, demand still is far ahead of production, according to the association.

Output of primary aluminum in the U. S. in December was 103,924,830 pounds and in January, 1948, it was 97,534,487 pounds.

Aggregate shipments of 119,285,000 pounds of aluminum wrought products in January were lower than for any month since September, 1947, when shipments were about the same. December shipments were 125,890,000 pounds.

The decrease in January was accounted for principally by lower shipments of plate, sheet, and strip.

Lead-Zinc Mine Examined

Washington—Results of an investigation of two lead-zinc mines in Stevens County, Wash., which in 32 years produced about 27,000 tons of lead worth about $8 million at 1948 prices, are described in a new publication of the Bureau of Mines.

As the high-grade ore in nearly all of the known ore shoots in the Electric Point and Gladstone mines—adjacent properties near the top of Gladstone Mountain—had been exhausted, Bureau engineers in 1946 dug nearly 14,000 linear feet of trenches in seeking possible new outcrops of lead ore. No evidence of lead in minable concentrations was found, but several dumps sampled contained 0.2 to 10 per cent lead, most of which could be recovered by simple ore-dressing methods, according to the report.

Dumps now on the properties are estimated to contain about 40,000 tons of ore and waste with a gross lead metal content of about 1000 tons.

Copper Wire Prices Reduced

New York—Leading producers of copper wire and cable have lowered their prices on insulated copper wire from 5 to 12 per cent. Reductions on service wire, which carries electric power from distribution lines into buildings, range up to 14 per cent. The reductions do not apply to bare, weather proof or magnet wire.

Products on which prices were reduced cover a relatively small percentage of the total amount of copper going into wire products, trade sources said.

Although wire mills have a large volume of unfilled orders, competition is reported growing.

Estimates and schedules for April deliveries are being drawn up by some copper sales offices. The supply situation still reflects effects of the long strike at the Kennecott mining properties in Utah. Although this strike ended in mid-February it will be the middle of May before refined copper produced from ores coming from this field will be of help to consumers.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 18.75-20.00c; 88-10-2 (No. 215) 29.50c; 80-10-10 (No. 305) 25.25c; No. 1 yellow (No. 405) 15.75-17.00c.

Zinc: Prime western 17.50c, brass special 17.75c, intermediate 18.00c, East St. Louis; high grade 18.50c, delivered.

Lead: Common 19.30-19.35c, chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloy (6-6 type) 20.50-21.00c; No. 12 foundry alloy (No. 2 grade) 19.50-20.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00c; grade 2, 20.50-21.00c; grade 3, 20.00-20.50c; grade 4, 19.00-19.50c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $88-$94 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.10.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $78-$81 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 37.18; yellow brass 34.58; commercial bronze, 95%, 37.23; 90%, 36.88; red brass, 85%, 36.01; 80%, 35.66; best quality, 35.33; nickel silver, 18%, 46.92; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.28; cold drawn 34.28; yellow brass, free cutting, 29.24; commercial bronze, 95% 36.92; 90% 36.57; red brass, 85% 35.70; 80% 35.35.

Seamless Tubing: Copper 37.22; yellow brass 37.59; commercial bronze 90% 39.54; red brass 85% 38.92; 80% 38.57.

Wire: Yellow brass 34.87; commercial bronze, 95% 37.52; 90% 37.17; red brass, 85% 36.30; 80% 35.95; best quality brass 35.62.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, f.o.b. eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $27.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft. Pipe: Full coils, $27.25 per cwt; cut coils, $27.50. Traps and Bends: List price plus 70%.

ZINC

Sheets, 22.00-22.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.75-21.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.75-20.50c; over 12-in., 20.75-21.50c.

NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c, Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, f.o.b. Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (anhydrous): In 400 lb bbl, 97.00c; in 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.875	18.625	18.125
Commercial Bronze			
95%	20.250	20.000	19.500
90%	20.125	19.875	19.375
Red brass			
85%	20.000	19.750	19.250
80%	19.875	19.625	19.125
Best Quality (71-79%)	19.750	19.500	19.000
Muntz Metal	18.250	18.000	17.500
Nickel, silver, 10%	20.250	20.000	10.125
Phos. bronze, A	22.625	22.375	21.375
Naval brass	18.750	18.500	18.000
Manganese bronze	18.750	18.500	17.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 18.50-19.00, No. 2 copper 17.50-18.00, light copper 16.50-17.00, composition red brass 14.25-14.50, auto radiators 12.25-12.50, heavy yellow brass 10.75-11.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.50, No. 2 copper 18.50, light copper 17.50, refinery brass (60% copper), per dry copper content 17.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.75-18.00, No. 2 16.75-17.00, light copper 15.75-16.00, No. 1 composition red brass 12.50-12.75, No. 1 composition turnings 12.00-12.25, mixed bras turnings 8.00-8.25, new brass clippings 15.25-15.75; No. 1 brass rod turnings 9.00-9.25, light brass 6.50-6.75, heavy yellow brass 9.00-9.25, new brass rod ends 11.75-12.25, auto radiators, unsweated 10.50-11.00, cocks and faucets 10.75-11.00, brass pipe 10.75-11.00.

Lead: Heavy 13.50-14.00, battery plates 7.00-7.50, linotype and stereotype 15.00-15.50, electrotype 13.50-14.00, mixed babbit 19.00-19.50, solder joints, 22.00-23.00.

Zinc: Old zinc 8.00-8.50, new die cast scrap 8.50-9.00, old die cast scrap 5.50-6.00.

Tin: No. 1 pewter 64.00-66.00, block tin pipe 82.00-83.00, No. 1 babbitt 50.00-53.00, siphon tops 49.00-51.00.

Aluminum: Clippings 2S 13.00-14.00, old sheets 8.50-9.00, crankcase 8.50-9.00, borings and turnings 4.00-4.50, pistons, free of struts, 8.50-9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Feb. Avg.	23.50	21.235	17.50	103.00	17.00	38.50	40.00	70.838
Jan. Avg.	23.50	21.325	17.50	103.00	17.00	38.50	40.00	70.00
Mar. 1-7	23.50	21.30–21.35	17.50	103.00	17.00	38.50	40.00	71.50
Mar. 8-10	23.50	19.30–19.35	17.50	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Hvy. Melt.	$37.00‡
No. 2 Hvy. Melt.	35.00‡
No. 1 Busheling	37.00‡
No. 1 Bundles	37.00‡
No. 2 Bundles	34.50-35.00‡
No. 3 Bundles	33.00-34.00‡
Heavy Turnings	35.50-37.50
Machine Shop Turnings	25.00-26.00*
Mixed Borings, Turnings	25.00-26.00*
Short Shovel Turnings	29.50-30.00†
Cast Iron Borings	26.00-27.00*
Bar Crops and Plate	44.50-45.50
Low Phos. Steel	43.00-44.00

Cast Iron Grades†

Mixed Yard	39.00-40.00
No. 1 Machinery Cast	46.00-47.00
Charging Box Cast	43.00-44.00
Heavy Breakable Cast	42.00-43.00
Brake Shoe	41.00-42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00
Axles	48.00-50.00
Rails, Random Lengths	47.00-48.00*
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Railroad Specialties	46.00-47.00
Angles, Splice Bars	50.00-51.00

* Brokers' buying prices.
† Nominal.
‡ Brokers' offering prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 2 Heavy Melt. Steel	34.00†
No. 1 Busheling	35.00-35.50
No. 2 Bundles	33.00†
Machine Shop Turnings	21.00†
Mixed Borings, Turnings	27.00-27.50
Short Shovel Turnings	27.00-27.50
Cast Iron Borings	27.00-27.50
Bar Crops and Plate	39.00-39.50
Punchings & Plate Scrap	39.00-39.50
Cut Structurals	40.00-41.00

Cast Iron Grades

No. 1 Cupola	43.00-44.00
Charging Box Cast	43.00-44.00
Stove Plate	40.00-41.00
Heavy Breakable Cast	35.00-35.50
Unstripped Motor Blocks	35.00-35.50
Malleable	40.00-41.00
Brake Shoes	35.00-35.50
Clean Auto Cast	45.00-45.50
No. 1 Wheels	42.00-43.00
Burnt Cast	35.00-36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.50-40.00
R.R. Malleable	40.00-41.00
Rails, Rerolling	50.00-51.00
Rails, Random Lengths	42.00-44.00
Rails, 3 ft and under	50.00-51.00
Cast Steel	43.00-44.00
Railroad Specialties	43.00-44.00
Uncut Tires	42.00-43.00
Angles, Splice Bars	45.00-46.00

† Nominal.

VALLEY

No. 1 Heavy Melt. Steel	**$37.50-38.00**
No. 2 Heavy Melt. Steel	37.00-37.50
No. 1 Bundles	**37.50-38.00**
Machine Shop Turnings	21.00-23.00
Short Shovel Turnings	24.00-25.00
Cast Iron Borings	24.00-25.00
Low Phos.	42.00-42.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.50-40.00

MANSFIELD

Machine Shop Turnings	$25.00-25.50
Short Shovel Turnings	26.00-26.50

CINCINNATI

No. 1 Heavy Melt. Steel	**$31.00**
No. 2 Heavy Melt. Steel	30.00
No. 1 Busheling	31.00
Nos. 1 & 2 Bundles	31.00
Machine Shop Turnings	21.00
Mixed Borings, Turnings	21.00
Short Shovel Turnings	23.00
Cast Iron Borings	22.00

Cast Iron Grades

No. 1 Cupola Cast	42.00
Charging Box Cast	35.00
Heavy Breakable Cast	35.00
Stove Plate	35.00
Unstripped Motor Blocks	30.00
Brake Shoes	32.00
Clean Auto Cast	42.00
Drop Broken Cast	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	34.00
R.R. Malleable	40.00
Rails, Rerolling	45.00
Rails, Random Lengths	38.00
Rails, 18 in. and under	46.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$29.50-30.00
No. 1 Busheling	32.50-33.00
No. 1 Low-phos. Bundles	33.50-34.00
No. 2 Bundles	29.50-30.00
Machine Shop Turnings	20.50-21.00
Mixed Borings, Turnings	21.50-22.00
Short Shovel Turnings	22.50-23.00
Cast Iron Borings	22.00-23.00
Punchings & Plate Scrap	35.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	38.00-40.00
Heavy Breakable Cast	33.00-35.00
Clean Auto Cast	38.00-40.00

BUFFALO

No. 1 Heavy Melt. Steel	$38.50-39.00
No. 2 Heavy Melt. Steel	33.50-34.00
No. 1 Busheling	33.50-34.00
No. 1 Bundles	33.50-34.00
No. 2 Bundles	30.50-31.00
Machine Shop Turnings	26.00-27.00
Mixed Borings, Turnings	26.00-27.00
Cast Iron Borings	26.00-27.00
Short Shovel Turnings	27.00-28.00
Low Phos.	38.00-39.00

Cast Iron Grades

No. 1 Cupola	36.00-37.00
Mixed Cast	34.00-35.00
Heavy Breakable Cast	31.00-32.00
Malleable	34.00-37.00
Clean Auto Cast	43.00-44.00

Railroad Scrap

Rails 3 ft. and under	50.00-51.00
Scrap rails	46.00-47.00
Railroad specialties	45.00-46.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$37.00-39.00
No. 2 Heavy Melt. Steel	33.50-34.00
No. 1 Busheling	33.50-34.00
No. 1 Bundles	37.00-38.00
No. 2 Bundles	30.00
Machine Shop Turnings	30.00
Mixed Borings, Turnings	29.00
Short Shovel Turnings	29.00-30.00
Bar Crop and Plate	40.00
Punchings & Plate Scrap	40.00
Cut Structurals	40.00
Elec. Furnace Bundles	40.00
Heavy Turnings	36.00-37.00
No. 1 Chemical Borings	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast	38.00-39.00
Charging Box Cast	34.00-34.50
Heavy Breakable Cast	34.00-34.50
Unstripped Motor Blocks	33.50
Clean Auto Cast	35.00-36.00
No. 1 Wheels	44.00-45.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$28.00-29.00
No. 2 Heavy Melt. Steel	25.00-26.00
No. 1 Busheling	23.00-24.00
No. 1 Bundles	28.00-29.00
No. 2 Bundles	22.00-24.00
No. 3 Bundles	nominal
Machine Shop Turnings	16.00-18.00
Mixed Borings, Turnings	16.00-18.00
Short Shovel Turnings	18.00-20.00
Punchings & Plate Scrap	30.00-31.00
Cut Structurals	nominal
Elec. Furnace Bundles	28.00-29.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
No. 1 Machinery	33.00-34.00
Charging Box Cast	30.00-31.00
Heavy Breakable	30.00-31.00
Unstripped Motor Blocks	26.00-27.00
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$28.00-29.00
No. 2 Heavy Melt. Steel	25.00-26.00
No. 1 Bundles	26.00-27.00
No. 1 Busheling	25.00-26.00
Machine Shop Turnings	19.00-20.00
Mixed Borings, Turnings	20.00-21.00
Short Shovel Turnings	22.00-23.00
Bar Crops and Plate	30.00-31.00
Punchings & Plate Scrap	30.00-31.00
Chemical Borings	28.00-29.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-37.00
Heavy Breakable Cast	34.00-35.00
Stove Plate	31.00-32.00
Unstripped Motor Blocks	28.00-30.00
Clean Auto Cast	29.00-31.00

CHICAGO

No. 1 Heavy Melt. Steel	$33.00-35.00
No. 2 Heavy Melt. Steel	30.00-33.00
No. 1 Bundles	33.00-35.00
No. 2 Bundles	28.00-31.00
No. 3 Bundles	26.00-29.00
Machine Shop Turnings	22.00-23.00
Mixed Borings, Turnings	22.00-23.00
Short Shovel Turnings	22.00-23.00
Cast Iron Borings	22.00-23.00
Bar Crops and Plate	36.00-39.00
Punchings	37.00-39.00
Elec. Furnace Bundles	35.00-36.00
Heavy Turnings	31.00-33.00
Cut Structurals	37.00-38.00

Cast Iron Grades*

No. 1 Cupola Cast	40.00-43.00
Clean Auto Cast	40.00-45.00
No. 1 Wheels	41.00-42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	36.00
Malleable	40.00*
Rails, Rerolling	45.00-46.50
Rails, Random Lengths	41.50
Rails, 3 ft. and under	45.00
Rails, 18 in. and under	45.00-46.00
Railroad Specialties	41.00-42.00
Angles, Splice Bars	43.00-44.00

* Nominal.

ST. LOUIS

No. 1 Heavy Melt. Steel	$32.00-34.00
No. 2 Heavy Melt. Steel	29.00-30.00
Machine Shop Turnings	20.00-21.00
Short Shovel Turnings	20.00-21.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-38.00
Charging Box Cast	31.00-32.00
Heavy Breakable Cast	32.00-33.00
Brake Shoes	31.00-32.00
Clean Auto Cast	36.00-38.00
Burnt Cast	27.00-30.00

Railroad Scrap

R.R. Malleable	33.00-36.00
Rails, Rerolling	42.00-43.00
Rails, Random Lengths	33.00-35.00
Rails, 3 ft. and under	39.00-40.00
Uncut Tires	39.00-40.00
Angles, Splice Bars	37.00-39.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$29.00
No. 2 Heavy Melt. Steel	29.00
No. 1 Busheling	29.00
No. 2 Bundles	27.00
Long Turnings	24.00
Short Shovel Turnings	24.50
Cast Iron Borings	24.50
Bar Crops and Plate	35.00
Cut Structurals	36.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Stove Plate	38.00-39.00
No. 1 Wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.50
R.R. Malleable	nominal
Rails, Rerolling	41.00-43.00
Rails, Random Lengths	38.00-40.00
Rails, 3 ft. and under	40.00-42.00
Angles and Splice Bars	40.00-42.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*23.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.00
Bar Crops and Plate	*25.00
Cast Steel	*25.00
Alloy Free Turnings	*15.00
Cut Structurals	*25.00

Cast Iron Grades

No. 1 Cupola Cast	35.00

Railroad Scrap

No. 1 Heavy Melting	*26.00
Wheels	*29.50
Rails, Random Lengths	*26.50

*F.o.b. California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling	27.50
Nos. 1 & 2 Bundles	27.50
No. 3 Bundles	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00
Heavy Breakable Cast	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	23.00
No. 3 Bundles	20.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	33.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	$30.00-35.00

HAMILTON, ONT.

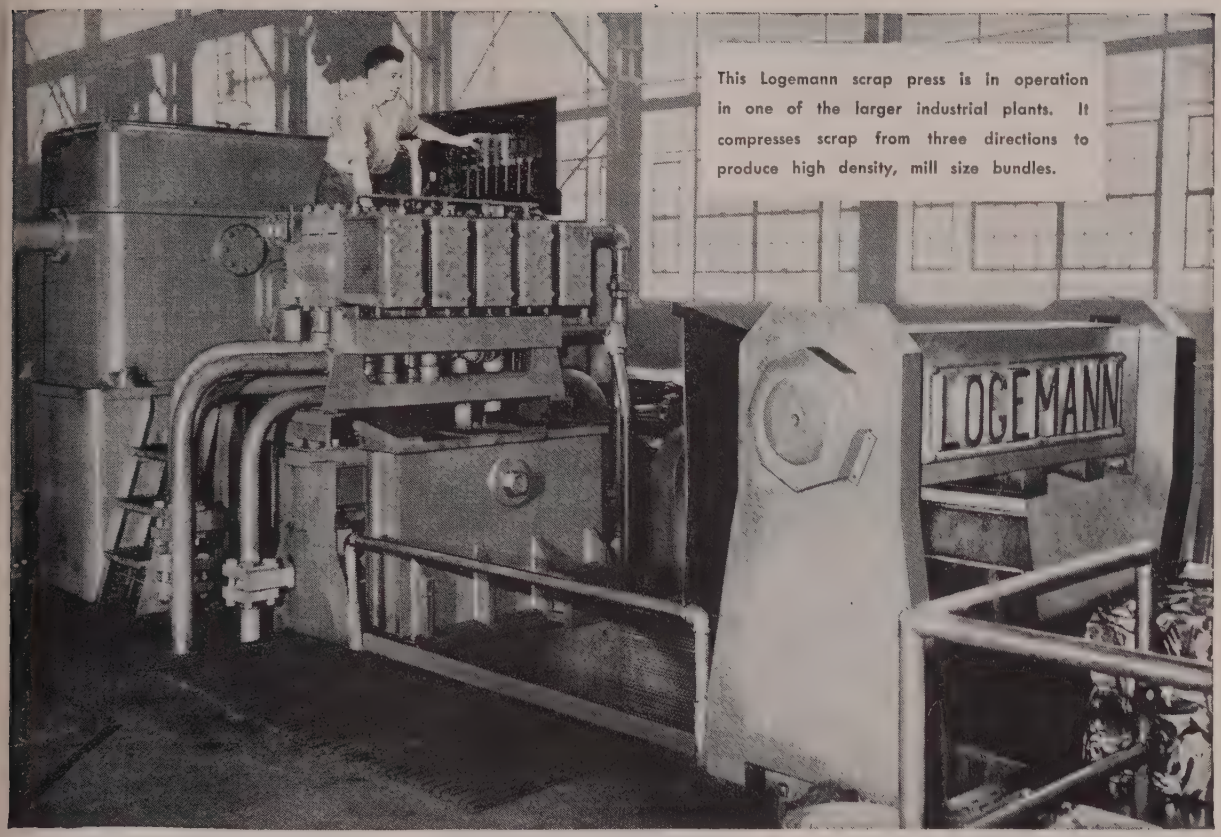
(Ceiling prices, delivered)

Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	48.00
No. 2 Cast	44.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

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Triple Compression..
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The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

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Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street • Milwaukee 10, Wisconsin

Sheets, Strip . . .

Easier sheet, strip supplies mean freight savings to some users who can pick closer mills

Sheet Prices, Page 150

Pittsburgh—Metalworking companies report increased ability to obtain sheet and strip. Some say they are realizing considerable savings in freight as result of being able to obtain necessary steel supplies from mills closer to their plants. This reflects mills' effort to cultivate customers within their logical marketing areas, and general easier steel supply situation.

Indication of growing belief that steel supply will improve is the report metalworking companies are no longer renewing contracts for premium priced steel. However, because of contract commitments, some of these companies will be forced to accept this type tonnage throughout first half.

Stainless steel producers state there has been little improvement in new order volume the past four to six weeks, with most interests offering relatively prompt deliveries, even in sheets and strip. Reflecting the more competitive situation in stainless, it is reported the smaller producers who originally raised prices 10 per cent across the board have since adjusted quotations to competitive levels.

Definite easing in demand is noted for lower grade silicon sheets, with requirements for transformer grades still holding up fairly well.

Boston—Openings in rolling mill schedules are promptly diked with backlog tonnage, but enough dent is being made in the wall to indicate second quarter distribution pattern will reflect new shades and shadows; business has not gone to pot, but steel, including flat-rolled, is less easily marketed. While some consumers are holding back April volume, necessitating rescheduling, new orders for sheet and strip are appearing, but more in line with users' revised estimates of requirements.

Steel mill backlogs, with operating rates hovering around 100 per cent for weeks and with buying on a more cautious basis, are moving in reverse for the first time in years; backlogs are still substantial, high for a normal period, but the nation's economy has been on a war or abnormal level so long, few outside the political fold would be so bold as to hazard a guess as to where the line of normal now runs. Among the larger users, this cautious trend in sheet buying is most pronounced; with nonintegrated cold strip mills there are scattered curtailments in finishing operations, but reason given is shortage of hot-rolled for processing rather than serious decline in buying or want of volume.

New York—Pressure on sheet mills is still heavy, even though there has been some let-up, with cutbacks in various instances and some cancellations. Outlook is for reasonable balance between supply and demand at a time earlier than most anticipate; yet some leaders still doubt there will be any real balance this

year. There is still considerable consuming power for properly priced products and the opinion is that once manufacturers can shake down their costs to a reasonable degree and concentrate efforts far more than in the past on medium priced merchandise, a good demand will develop. This is assuming that economic readjustments continue orderly, and there are few who expect any sharp decline in the near future.

Sheet quotas for noncertified consumers in second quarter have been set up on about the same basis as for first quarter, although there are some indications consumers may obtain larger allotments before the period is over.

Cleveland — Demand for carbon sheet and strip continues considerably in excess of supply. Apparently spurred by belief that curtailed operations by some consumers may make sheet and strip easier to obtain, a number of metalworking companies have asked one leading producer for increased allotments of these products. This producer is now setting up its June quotas for sales districts and indications are that despite capacity ingot production the tonnage of sheet and strip will not be sufficient to supply all demand. However, one consumer who has had to cut production to a 3-day week because of insufficient sheet and wide strip reports narrow strip is in easier supply and has turned down offers of this product.

Cincinnati—Demand for sheets, excepting in stainless, continues strong at district mills. However, the change by one mill from allotments by quarters to a month-to-month basis may be a reflection of current market trends. Pressure for deliveries has relaxed, although supply has not yet caught up with apparent demand, some of which has undoubtedly come from fabricators veering from gray market tonnage.

Birmingham—Birmingham steel sources describe sheet demand as the most insistent of any specification. The clamor comes from a variety of sources—oil drum manufacturers, cabinet makers and to a lesser extent, momentarily, from agricultural sources. No prospect of substantial improvement in the supply situation is seen for the near future. A moderate strip demand is evident.

St. Louis—Spottiness in cold-rolled sheet demand is on a slight increase but generally restricted to the same industries which have been soft locally for some weeks—household small appliances electrical industry, refrigerators, washing machines and heating equipment. There is no weakness in farm equipment or roofing, however, and jobbers have not ceased their pressure to build inventories.

Granite City Steel Co.'s abolition of a $10 premium on cold-rolled sheets brought numerous inquiries from eastern buyers, especially from New York steel exporters. Since the mill's second quarter was sold out before the price cut, none was accepted. Third quarter books will open early in May, officials said.

Los Angeles—Although mill cancellations are not increasing, more flat-rolled material is being made available from fabricators' inventories. Consumers in some instances are of-

fering their surplus stocks at cost while in other cases sheets are being swapped for other wanted items. Galvanized and deep-ribbed sheet still are in extremely short supply.

San Francisco—Scarcity of sheets slowly is diminishing although overall demand continues to exceed supply. Galvanized sheets are tightest of all rolled products. A few fabricators are reported canceling orders, and others are carrying inventories on hand-to-mouth basis in fear of steel price cuts later in the year. Test of market appears likely within next three months. Failure of seasonal upturn may cause many to become more cautious and curtail buying to an even greater extent.

Philadelphia — There is a continued definite easing in sheets. Producers still have substantial backlogs and anticipate high operations for some months to come. Nevertheless, there are an increasing number of openings in schedules and most mills undoubtedly will be able to supply regular customers with more tonnage in the second quarter than recently set up under their quotas.

Indicative of the easing pressure in sheets was the recent offering by a large mill of a carlot of excess tonnage, comprising popular gages of hot-rolled sheets, to a half dozen customers without finding a taker. Only a short time ago such an offering would have been snapped up promptly. Another large mill had to offer a carload of cold-rolled sheets, all of one gage, to more than two of its regular customers before being able to sell it.

Meanwhile there are various cutbacks and some outright cancellations. Total volume involved has not to date been too heavy but nevertheless there is definite slackening in interest. Most leading mills are advising their branch sales offices to refer to them first for action any tonnages cutback or canceled, as they may wish to divert the tonnage to consumers in other districts. However, at the same time they also are cautioning their district men to advise them promptly of any new prospects for business in their own areas.

Chicago—Demand at regular mill level for carbon flat-rolled products continues sustained but lacking the insistent character of a short time ago. Cancellations have not risen alarmingly and deferments are avowedly for the purpose of inventory balancing. It is known, however, that "inventory balancing" in some cases means inventory liquidating, even in the heretofore scarcest products.

Steel Bars . . .

Bar Prices, Page 150

Pittsburgh—Alloy bar producers note relatively large number of order cancellations or voluntary reduction in mill allotments. However, openings in rolling schedules continue to be quickly taken up by other customers and no difficulty has been experienced to date in lining up second-quarter production schedules.

Many consumers are much more inventory conscious, with result pressure for deliveries has eased somewhat. However, some concerns still are unwilling to pass up position on mill rolling schedules. Order volume from automotive interests holds at relatively high level, although it is recognized this situation could change abruptly. Despite somewhat larger volume of order cancellations in recent weeks, cold-finished bar interests state output continues to fall substantially behind demand, and production schedules remain limited to hot-rolled bar supply.

New York—A mixed situation prevails in hot carbon bars. While some consumers, including notably the car shops, are specifying less freely, others appear to be placing more pressure than ever on mills. This latter situation is explained in part by resistance of buyers to payment of premium prices and to their efforts, therefore, to fill all requirements through mill channels. Some buyers report certain success in this respect; others still experience difficulty.

The situation in cold drawn carbon bars is fairly easy. Consumers can obtain reasonable deliveries from cold drawers on practically all specifications; and where they do have difficulty and perhaps want especially quick delivery they can usually obtain what they want from jobbers, whose cold drawn inventories are in good shape. Alloy bar deliveries are generally available within a few weeks from mill.

Philadelphia — While medium size carbon bars are easier, consumers still complain of difficulty in

getting small rounds and flats and large rounds, ranging anywhere from four inches and larger. Cold-drawn carbon bars in practically all sizes can be had for fairly early shipment. In reviewing the general easing in steel demand that has been taking place over recent weeks, it appears that cold-drawn bars were the first of all carbon grades of steel to be adversely affected. Alloy bar deliveries can be readliy had within a few weeks.

Cleveland — Reflecting inventory adjustments downward into line with reduced operations, some consumers are revising their hot-rolled carbon bar orders downward or canceling out tonnage. However, any tonnage thus becoming available is quickly taken up by other consumers, according to a leading producer. Reporting no appreciable change yet in hot bar demand by cold finishers, this hot bar producer would, however, not be surprised to see a decline. On hot bar shipments this producer is from two to four weeks of being current with its allotments.

Birmingham—The trade continues to call for bars, especially concrete reinforcing. The cry is hardly as insistent as it was two weeks ago, a mill source said, but a continued heavy demand is expected at least through the first half of the year.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 150

Seattle — Rolling mill operations continue at peak capacity, sizable backlogs assuring continued activity for months. Offerings in small lots are numerous. Considerable business in heavy tonnages is up for figures. Improved weather is giving mills opportunity again to ship and adjust delivery schedules accordingly. Bethlehem Pacific Coast Steel Corp., Seattle, booked about 200 tons in miscellaneous projects.

Structural Shapes . . .

Structural Shape Prices, Page 151

New York — Structural activity continues spotty, although some sizable awards are reported. Outstanding are 4100 tons awarded by Ford, Bacon & Davis, this city, for a power plant at Marietta, O., and 2500 tons for an exit viaduct for the New Jersey side of the Holland tunnel, placed by the New York Port Authority. New inquiries are light.

Fabricators report some easing in raw material supply, but point out their inventories are still far from normal both with respect to volume and to diversity of specifications. Some of the smaller shops are now able to promise shipments within two to three months, but the larger fabricators are booked up four to five months and in the case of the very largest, five to six months.

Birmingham—Shapes show what is described locally as remarkable steadiness in the overall demand situation, although no large scale contracts are noted. Especially heavy is the insistence for relatively lighter gages. Mills say they see no appreciable

let-up in the immediate future.

Seattle—Fabricators report inquiry for shapes is dragging, although with the advent of better weather and resumption of outside construction, conditions are expected to improve rapidly. One large shop has a six-months backlog, others report normal operations. Larger deliveries from coast mills are reported but allocations of eastern mills are below current needs, especially for wide flange beams which are extremely short.

Chicago — Existence of sizeable order backlogs are not lulling fabricators into a sense of complete security, there having been an upsurge in interest in available business despite the absence of any substantial improvement in steel supply. Little new business, however, is up for figuring and no one in the industry is able to tell whether the present lag is seasonal or more deeply seated. Outstanding project pending is Chicago, Burlington & Quincy's railroad bridge relocation job at Alma, Neb., estimated to require 1500 tons.

Plates . . .

Plate Prices, Page 151

Philadelphia—Railroad car requirements are being cut back, and some trade predictions are that present allocations of car steel generally, amounting to about 250,000 tons per month, may be reduced as much as 50 per cent before the end of the second quarter, unless there is a sharp upturn in car buying in the meantime. Last month domestic freight car awards of 332 were the lightest in recent years. However, plate producers appear confident that regardless of such cutbacks that now appear probable they wil still have enough work to maintain high operations throughout the second quarter.

New York—Pressure for plates is easing, but to date this has been refletced principally in demand for premium priced material. Even most of the mills which have been charging some premiums compared with others, claim that they still have all the demand they can handle, notwithstanding cutbacks in certain lines, notably railroad car construction. They look for a full second quarter, and for a reasonably active third quarter.

The newly approved voluntary allotment program for shipment of 104,775 tons of plates for foreign aid over a 5-months period, from May to September, will offset the decline in car demand somewhat, and considerable work is still in prospect in other directions.

Demand for floor plate has shrunk appreciably, due not only in part to less industrial construction but to the falling off in substitution of floor plate for plain carbon plate.

Chicago—Plate fabricators whose operations are still restricted by inadequate steel supply see signs of improvement in two developments: (1) Reduced voluntary allocations to certain of the plate consuming programs—freight cars, barges, armed forces; (2) tapering of demand for steel in general, upshot of which, some speculate, will be a rejuggling

of product mix to allow for more plate output. Fabricators are finding that delivery promises are of increasing importance in getting new jobs, costs and general business uncertainty making prompt performance especially desirable.

Birmingham—The plate market remains practically as tight as during the latter days of the war. The stringency is intensified by the cutting off of supplies to a virtual dribble at Gadsden.

Los Angeles—Overall demand is strong and backlogs of heavy plate fabricators loom very large. Nevertheless, the lessened activity of tank manufacturers, who comprise the principal outlet for light plates, currently is being reflected in slower demand in this category.

San Francisco—Plates are still most critical of all steel items, and there is no prospect of increased supply or reduced demand. Discussions of new pipeline projects indicate needs for plates will take up all production for several years.

Seattle—Plate fabricators are restricted in operations by continued shortage of materials, and are confining themselves to inventory limits. There is a fair demand for items involving plates.

Wire . . .

Bethlehem Steel Co. and Portsmouth Steel Corp. lower prices on wire and wire products

Wire Prices, Page 151

New York—Bethlehem Steel Co. has reduced price schedules on galvanized wire products, effective Mar. 4. In the galvanized merchant products, wire was reduced $3, fence and barbed wire $3 and stone wire $6, with galvanizing extras on nails off $5. The new price on galvanized merchant wire is now 5.35c, Sparrows Point, on galvanized fence column 109 Johnstown, Pa., and galvanized barbed wire column 123 Johnstown and column 125, Sparrows Point. These changes bring prices back to where they were in early December last year. Galvanizing extras on various manufacturers wire products also have been reduced as of Mar. 4.

Portsmouth, O.—Effective Mar. 10, Portsmouth Steel Corp. announced a downward reduction in prices on various wire and wire product items, bringing its schedule in line with prices quoted by other producers. It now quotes basic MB spring wire, 5.55c mill; upholstery spring wire, 5.20c; merchant quality wire, 4.80c; galvanized wire, 5.40c; nails and staples, col. 103; woven fence, col. 109; barbed wire, col. 123; bale ties, col. 106. Manufacturers wire is now quoted 4.15c mill.

Boston—Wire users are in some cases holding up April volume, in whole or part, but at same time are asking producers as to delivery lag should tonnage be rescheduled. This indicates numerous consumers, for the next few weeks at least, depend heavily on inventories and are watching business conditions.

Considerable readjustment of early second quarter production schedules is necessary with slight improvement in rods. While cutbacks in some specialties are sharp, including clock spring material, there is slight, if any, decline in automobile requirements. Music wire is available from stock on some sizes, with deliveries of others in 30 days, except finest sizes.

Pittsburgh—Some softening in demand is noted for upholstery spring wire, and pressure for shipment of other manufacturers wire items appears to be easing. Producers state production schedules are full through first half, but are unwilling to make predictions past this period.

Jobbers' stocks of merchant wire products are best in years, and there is increasing tendency among distributors to tie purchasing policies in with normal seasonal demand.

Chicago—"Buy-word" is caution in wire ordering, manufacturing wire demand being extremely hesitant from many directions and April ordering well under normal expectations, according to some producers. Demand for wire rope remains fairly constant, and for nails and barbed wire strong. Distributor stocks of netting and certain other farm needs are high and will be worked off before new orders begin to come in.

Birmingham—The slackening in demand for wire continues. This is true especially of barbed wire and certain types of fencing, along with some softening in manufacturers wire.

Tubular Goods . . .

Tubular Goods Prices, Page 151

Pittsburgh—Sellers note continued leveling off in demand for all tubing classifications, notably for alloy and stainless. In some instances deliveries are available within two to three weeks for more common grades of stainless tubing. Some electric welded tubing producers are faced with increasing competition over coming months. Many tubing producers are quoting at mill, while others are meeting competition when desirable. Boiler tubes remain under strict allocation, although railroads are no longer accepting full mill allotments. Hot-rolled mechanical tubing is in better supply than cold-drawn, some interests having had books closed on cold-drawn since last fall.

Los Angeles — Small-diameter pipe and tubing generally are in good supply, with users' requirements off substantially. Demand from the petroleum industry for maintenance materials is about normal, but equipment needs for new drilling are off approximately 50 per cent from the level prevailing at close of 1948. Reduction in such requirements in the past 60 days has characterized both domestic and foreign exploitation. Situation was brought about by a combination of factors—among them a seasonal decline in demand and the long-time maintenance of peak production. So that present excess of crude supplies can be worked down, new drilling, refinery output, and oil imports all are being curtailed.

Seattle—The cast iron pipe market is unusually inactive for this season. This is attributed to recent severe weather. Several sizeable projects are about to be released and an improvement in demand is expected shortly.

Warehouse . . .

Warehouse Prices, Page 153

New York—Orders for steel from warehouses are holding well with some pickup this month after an earlier slight slackening; this in part reflects more hand-to-mouth buying by more consumers for sizes and grades missing from inventories. Demand for standard carbon products, including sheets, structurals, plates and bar angles is in excess of supply and continues to move from warehouse without going into stock. Warehouse allocations on these products are no heavier. Distributor inventories of alloys, tool and die steel and most specialties are in better balance with demand.

Pittsburgh—Inventory position of most steel distributors continues to be ample for such items as cold-finished bars, stainless and alloys. Some improvement also has been noted in carbon bars and sheets. Cold-drawn mechanical tubing stocks remain inadequate, said to be attributed to fact consumers of standard pipe are substituting tubing due to scarcity of the former item.

Cleveland — Some warehouses report demand since Mar. 1 has been above the February level, the upturn said to be coming from consumers

who had completed reducing their inventories to levels more in line with their lower rates of operation. This upturn extends even to cold-finished and cold-rolled products.

However, the overall demand on warehouses is off from what it was a few months ago. In view of this and improved receipts of steel from mills in February, one warehouse is now letting an increasing proportion of its mill allotments go into products in lesser demand and rounding out its stocks.

One warehouse here reduced its cold-rolled carbon strip 20c a hundred pounds, effective Mar. 8, that distributor now quoting $6.50 a hundred at the warehouse. There were indications last week that cold-finished carbon bar prices were being studied by some warehouses with a view of a possible reduction.

Cincinnati—Warehouses of the district have enough business to absorb available prime steel, but note a slackening of interest by large customers, normally getting most supplies from mills. There is no determination, in jobbers' reports, whether this is a drop in needs or better mill supply. Sales of secondary steel, in almost all categories, are off sharply. There is a pickup in inquiries for building steel, mostly on minor projects.

Boston — While the turn to hand-to-mouth buying by more steel consumers is aiding warehouse volume, demand is not up to previous quarter, although in case of most carbon products it is in excess of supply. Moderate easing in sheets, strip, plates and structurals by mill buyers is not yet reflected in material improvement in tonnage to warehouses, although this may not be far off. In balance with demand are stainless, tool and die steels, and most alloys. In pricing at warehouse levels, distributors are hampered by changes in supply sources and varying freight costs, but with signs of more competitive selling developing at mills some improvement in this may develop.

Los Angeles—Steel jobbers report their new orders continue to show a small but steady gain. The decline in deliveries in most cases was reveresd early last month, and warehousemen are inclined to be optimistic about the trend. Generally speaking, the improvement has centered on light steel products. Demand is slow in heavy categories, and jobbers can get more than they need of some structurals and some sizes of bars. Requirements for light-gage plates are down noticeably, with tank manufacturers affected by the cutback in oil field activity. Sheets remain in the tight category, although jobbers are picking up some surplus from fabricators, and in most instances have been given larger second-quarter mill allocations.

San Francisco—Demand from small users continues poor, and some fabricators are offering excess supplies of steel to jobbers. Warehouse inventories continue unbalanced, with sheets and plates in shortest supply. Stocks of nearly all other steel items are close to parity with demand, and several are in excess of needs.

Philadelphia — Despite the near approach of spring, district jobbers report that business so far in March is down from February on a day-to-

day basis. This is contrary to the usual trend at this season of the year, and, according to one large distributor, sales in March will be off from February, despite the former being the longer month, unless there is an early and definite improvement in trading. Jobbers report sheets are more plentiful, but complain of continued difficulty in obtaining an adequate supply of light carbon bars, big rounds, bar shapes and light plates.

Pig Iron . . .

Pig Iron Prices, Page 152

New York—Most district foundries continue to take in iron at about the same rate as they have for the past two months. There are some notable exceptions, but in general they have not cut back much on their quotas even though there has been a shrinkage in operations. In most instances local pig iron consumers have had little or no inventories on hand and are now building them up a bit where possible.

However, unless there is an early turn for the better, curtailments will become much more general. Not only will inventories in many instances soon be restored to normal, but there will be a disposition to coast for a while on the possibility there may be an easing in prices. Up to now, though, there have been no signs of an early easing in prices, except where marginal producers have been charging stiff premiums.

Pittsburgh—Leading foundry interests expect clarification of the uncertain demand outlook by close of May. At the moment, many of the larger foundries are operating under full production schedules, although substantial order cancellations have sharply reduced order backlogs in recent weeks. Many of these interests anticipate a pick up in demand during April and May.

Jobbing foundries continue to operate but three to four days a week, with no significant improvement in new order volume indicated this quarter. Jobbing shops report competition developing from foundries out of this district, a situation which has not prevailed since prewar. Another sign of the changing competitive situation in pig iron is report that some merchant iron has been offered here by producers outside this district. Increased supply of pig iron in relation to scrap has prompted some foundries to increase pig iron melt due to price differential. Some interests, however, have problem of liquidating inventories of high priced foreign iron at price levels above that of best cast scrap grades.

Cleveland—A slight increase in pig iron demand reported in February by one seller has not become extended in March. However, leading producers report all their output is in demand, although foundry operations remain at a reduced level. The larger foundries are reported to still be trying to increase the proportion of iron in their melts.

Republic Steel Corp., which has entered into a new contract to operate the government-owned blast furnace leased to Kaiser-Frazer Corp., said it will continue to participate in

the northern pig iron business to the same extent as now.

Buffalo—An additional sour note was injected into the pig iron trade during the week as railroad malleable plants were reported paring operations. While the dip has been limited, rail casters report a slackening, part of which, is attributed to railroads using more gray iron casters when it is possible. The Tonawanda Iron Corp. will shut down its furnace on May 1 for a complete rehabilitation job. The furnace is expected to be down for about two months.

Philadelphia—Pig iron demand continues to decline although at a lesser accelerated rate, with some trade interests looking for a general leveling off in the near future. There continue to be some suspensions and even outright cancellations, but they are fewer in number. Most cancellations to date come from foundries which want to get rid of high priced inventory before again becoming active in the pig iron market. These high priced inventories represent foreign tonnage principally, although some tonnage consists of shipments received from certain domestic furnaces which up until recently at least have been quoting high premiums. Meanwhile pig iron consumers generally are becoming much more exacting with respect to specifications.

Cincinnati—An easier supply situation in pig iron is traced directly to the reduced melt. Shipments into the district are slow to expand but melters can get merchant iron now, in most analyses, rather promptly. Foundries look for an early upturn in business.

Chicago—Bush beating for business is no longer limited to foundries, pig iron producers and sellers now reporting the need for a determined sales effort to dispose of such exquota tonnage as becomes available from time to time. Decline of foundry operations rather than lower level of scrap prices is largely held to blame for this condition. Also to blame is the reluctance of melters to build up stocks in excess of immediate requirements.

Birmingham—Pig iron production remains at capacity. Some users have trimmed their quotas voluntarily, but there are other takers to hold the general supply situation tight, although hardly to the degree as in recent weeks, especially with scrap having plummeted to the lowest level of many months.

St. Louis—Cancellations or reductions in pig iron orders continue to reflect the doldrums in the foundry industry here. Some of these are the result of eagerness of foundries themselves to lower inventories, and some the result of their customers cutting down on stocks of castings. In their farm equipment and heavy steel castings lines there are occasional indications the minimum inventory level may have been reached. Hence ironmakers forecast a pickup in orders in April.

Although iron demand has eased sharply below two months ago, furnaces are still allocating to customers and can set aside no ground stocks. Local iron production has remained unchanged at 1000 tons daily for several weeks.

Scrap . . .

Scrap Prices, Page 156

Pittsburgh—Leading consumers continue out of the market for open-hearth scrap grades and turnings. A major steel producer was offered about 10,000 tons of No. 2 dealer scrap last week at $35 a ton from three brokers. On basis of these offers, which were rejected, Pittsburgh market for open-hearth grades would appear to be $37 for No. 1 heavy melting. Orders for No. 2 heavy heavy melting dealer scrap at $37 will not be filled for at least two to three weeks. Brokers and dealers report some difficulty in buying heavy melting steel for $36 or less to fill $37 orders. One broker claims to be still paying above this level to fill $41 orders, shipment on which had been held up.

Some mills have been able to purchase No. 1 heavy melting railroad scrap at $40, off $2 from last sale. Railroad specialties were reportedly purchased by brokers and dealers within range of $46-$47.

On basis of recent offerings, cast grades are off $5 to $6 from previous quotations.

Further weakness is noted in turnings market, with "crushers" unable to induce new mill buying; in fact leading consumers have held up shipment on old orders. Some distress mixed borings and turnings recently were sold to dealer for as low as $23, but range of brokers' buying prices is believed to be more representative at $25-$26.

Jones & Laughlin expects to receive 10,000 tons of German scrap this month. It is reported major steel producers do not intend to renegotiate foreign scrap contract shipments at former price levels.

Cincinnati — The iron and steel scrap market continues weak in absence of fresh buying combined with desire of melters to reduce inventories. Demand for cast grades is especially dull, and quotations have been cut further. Considerable open-hearth tonnage is moving, although some outlets for these grades are restricting deliveries.

Buffalo—Price declines in the scrap market were extended 50 cents to $1 in steelmaking grades while considerably sharper reductions were posted on cast items. While the declines on steelmaking grades were recorded in a nominal market, the new ranges were considered more in line with current bids and offerings in view of the paucity of buying interest by mills and a slash in prices being paid at dealers' yards. In addition, two railroads sold their No. 1 heavy melting offerings at $40 a ton which substantiates the lower market here.

Birmingham—Scrap tumbled noticeably during the past week with heavy melting leading the parade in a drop from $33 to $29 and most other items scoring a comparable break. The district's largest user is not buying at the moment. Some observers believe the bottom is about reached and that there will be a leveling off in short order.

St. Louis—Scrap quotations remain on a guesswork basis, with no new orders being placed and mills and foundries appearing to be getting

their daily melt from old orders. Stockpiles, therefore, are holding about level at around 60 days. No one expects substantial resumption of buying before Apr. 1, probably by the foundries. Market for No. 2 melting steel here is circumscribed by higher prices paid elsewhere.

Dallas — Further weakness appeared in the scrap market in Dallas the past week with yards and brokers buying on a cautious hand-to-mouth basis, in line with demand, and with future buying outside March delivery. Open-hearth No. 2 is quoted at a maximum of $37 a gross ton to deliver on Pittsburgh basis, or $18 to $20 a ton net at Dallas. Some yards are selling what they can produce, but with considerably more difficulty, and then in much smaller lots.

Los Angeles—Buyers and sellers of scrap are playing it close to the vest. Mills have substantial inventories, with the result they are buying little and buying it with a careful eye to quality. Out-of-state scrap finds few takers, for there is no inclination to pay the added freight cost. Japanese scrap is moving into this district in fairly good volume, one shipment of 18,000 tons of heavy melting material being received last week. To many in the trade, all this adds up to the possibility that prices for steelmaking scrap will not long hold at present levels. Cupola cast is unchanged, although foundry requirements are extremely limited.

San Francisco — Mill inventories continue in good shape, and prices on steel grades remain steady. Fontana mill is reported to have supply of 85,000 tons on hand. Some mill managers fear recent drop in prices may slow up supplies, but other steel executives doubt that a serious shortage on the West Coast will appear before the end of the year.

Cast iron scrap remains weak, with little moving. Foundries still hope for a pick-up in business this spring.

Seattle—Steel scrap dropped $2.50 to $25 gross Mar. 3, representing the second cut within the last month. Shipments from Japan and increased receipts from domestic sources have contributed to this decline. Shippers and dealers appear to be cooperating under the revised price schedule. Bethlehem Pacific Coast Steel Corp. expects a second full cargo of 9000 tons to arrive at the local mill from Japan, Mar. 14. This material is of excellent quality and will supply the Seattle plant for about two weeks. Land transportation is resuming after weather interruptions and shipments are increasing, permitting buyers to add to inventories. Receipts from ship breaking plants are are decreasing as the supply of surplus ships is about exhausted.

Iron Ore . . .

Iron Ore Prices, Page 152

San Francisco—Kaiser's Fontana mill in southern California now is obtaining about 75 per cent of its iron ore needs from the Eagle Mountain mine which opened a few months ago. The mine is located near the California-Arizona border. The remaining 25 per cent of Fontana's ore is being supplied from deposits

in Utah. Fontana is using 90 per cent Utah coal and the remainder from Oklahoma.

Ferroalloys . . .

Ferroalloy Prices, Page 153

Johnstown, Pa.—Bethlehem Steel Co. has advanced standard ferromanganese $12 a ton to $174, Johnstown, Pa., on all shipments, effective Mar. 7.

Birmingham — Sloss-Sheffield Steel & Iron Co. advanced its price on ferromanganese $12 a ton, effective Mar. 9. The company has posted a price of $174 a ton f.o.b. Birmingham.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 152

Chicago—Foundry coke is reportedly in easy supply, and the slackening of demand extends into higher quality material as well. While local producers' prices remain unchanged, the Terre Haute producer, practically none of whose product moves into this district, recently reduced price 80 cents to the basis of $20.20 f.o.b. furnace.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4500 tons, bridge and power house, Marietta, O., Electro Metallurgical Div., Union Carbide & Carbon Corp., to American Bridge Co., Pittsburgh.

4100 tons, power plant, Marietta, O., through Ford, Bacon & Davis, New York city, to Ingalls Iron Works, Birmingham, Ala.

2500 tons, exit viaduct on the New Jersey side of the Holland tunnel, New York city metropolitan district, for the New York Port Authority, to American Bridge Co., Pittsburgh.

900 tons, four state institutional buildings, Rockland county, New York, through Cauldwell-Wingate Co., New York city, general contractor, to Bethlehem Fabricators, Bethlehem, Pa.

900 tons, hospital, Anaconda Copper Mining Co., Butte, Mont., to Bethlehem Steel Co., Bethlehem, Pa.

550 tons, state bridge, Jamaica Avenue, Long Island, to American Bridge Co., Pittsburgh.

425 tons, building, F. W. Woolworth Co., Hempstead, Long Island, to Grand Iron Works Inc., New York.

360 tons, warehouse, General Foods Corp., Kearney, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, state bridge, St. Lawrence county, New York, through Law Bros. & A. J. Leaf, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, addition to Public School No. 77, Brooklyn, to Schacht Steel Construction Inc., New York.

160 tons, state bridge, Trenton, N. J., to American Bridge Co., Pittsburgh.

Unstated, railway type hoist car and spillway machinery for Fort Peck project, to Willamette Iron & Steel Co., Portland, low $52,500.

STRUCTURAL STEEL PENDING

650 tons, estimated, highway bridge, Dais Dam, Nev., Bureau of Reclamation, American Bridge Co., Denver, low.

400 tons, stop logs for Coulee dam; Pacific Car & Foundry Co., Seattle, low.

350 tons, garage, The Texas Co., East 43rd street, New York city, pending.

200 tons, hangar for United Air Lines, Seattle; bids in.

160 tons, 331-foot state bridge over Snake river, Idaho; general contract to Brennan & Cahoon, Spokane, low, $101,957.

Unstated, warm storage motor pool building, Fort Richardson, Alaska; Patti-McDonald Construction Co., Kansas City, Mo., low to U. S. engineer, $270,490.

Unstated, slide gates and operating machinery for fishway McNary dam, Oregon; Northwest Marine Iron Works, Portland, apparently low to U. S. engineer, $130,759.

Unstated, 6-span, 457-foot Okanogan river, Washington state; bids scheduled for May by U. S. engineer.

Unstated, 1140-foot Columbia river bridge, three main spans; bids in preparation by U. S. engineer; bid call planned for November.

Unstated, garage for Alaska Road Commission, Fairbanks; Robert W. Slater, Fairbanks, low $367,800.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, miscellaneous small projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

135 tons, sheet steel piling, navy purchasing office, New York, to Bethlehem Steel Co., Bethlehem, Pa.

REINFORCING BARS PENDING

3125 tons, north dam, Columbia Basin project; bids to Bureau of Reclamation, Apr. 1.

1000 tons, addition to Gorge power house, Skagit river project; Guy F. Atkinson Co., San Francisco, low to Seattle, $3,188,268.

900 tons, two schedules West Canal, Columbia Basin project; Morrison-Knudsen Co., Seattle, low, $6,136,234; contract also involves two railroad bridges, tonnage unstated.

450 tons, Junior high school, Seattle; general contract to J. G. Watts Construction Co. and S. Birch & Sons, joint low $1,545,000.

165 tons, state overcrossing, Spokane county, Washington; general contract to Clifton & Applegate, Spokane, low $212,626.

155 tons, Washington state arch bridge, Lincoln-Stevens counties; general contract to Henry Hagman, Cashmere, low $233,698.

Unstated, Oregon state highway projects, awards as follows: Two concrete bridges, Douglas county, to Hamilton & Thompson, Eugene, low $119,100; 233-foot concrete viaduct, Benton county, to Lindstrom Bros., Portland, low $74,967.

Unstated, warehouse for Seattle Terminals, E. Marginal Way and Spokane St., 220 x 480 feet; general contract to B. F. Turnbull.

PLATES . . .

PLATES PENDING

150 tons, estimated, outlet pipe, Missouri River Basin, St. Francis unit project, Bureau of Reclamation, Denver, Berkeley Steel Construction Co., Berkeley, Calif., low.

Unstated, 44-in. diameter welded steel pipe outlet works, Ochono dam, Deschutes project, Oregon; bids to Bureau of Reclamation, Apr. 5; schedule No. 2590.

Unstated, 14,000 feet 42-in. pipe for repair Cedar river line No. 2; plans approved by Seattle; bids soon.

Unstated, welded steel pile sections for Hungry Horse dam; bids to Bureau of Reclamation, Columbia Falls, Mont., Mar. 24.

PIPE . . .

STEEL PIPE PLACED

6400 tons, 22-in. steel pipe, Standard Oil interests, New York, to Republic Steel Corp., Cleveland.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Erie, nine diesel-electric switch engines, with five going to the Baldwin Locomotive Works, Eddystone, Pa., and four to the Lima-Hamilton Corp., Lima, O.

RAILROAD CARS PLACED

Bangor & Aroostook, 100 50-ton gondola cars, to Magor Car Corp.

Northern Pacific, 200 70-ton ore cars, to Northwestern Improvement Co.

CONSTRUCTION AND ENTERPRISE

ILLINOIS

AURORA, ILL.—Independent Pneumatic Tool Co. has awarded a $100,000 general contract to Robin Construction Co., 6214 N. Whipple St., Chicago, for construction of a factory; A. Epstein & Sons, 2011 W. Pershing Rd., Chicago, architect.

BLUE ISLAND, ILL.—Briggs & Turvas Inc., Western Ave. & 139 St., has awarded a $150,000 contract to Abell-Howe, 53 W. Jackson Blvd., Chicago, for construction of a factory.

CHICAGO—Motorola Co. Inc., 4545 W. Augusta Blvd., has awarded a $125,000 contract to Ragner Benson Inc., 4744 W. Rice St., for construction of a plant; Victor L. Charn, 4744 W. Rice St., architect.

CHICAGO—3201 S. Kostner Ave. Building Corp. has awarded $450,000 separate contracts for construction of a plant; Sidney H. Minchin, 127 N. Dearborn St., architect.

FRANKLIN PARK, ILL.—Bruner & Lay Inc., 727 S. Jefferson St., Chicago, is erecting a $250,000 tool manufacturing plant on a separate contract basis; W. Fred Dolke Jr., 189 W. Madison St., Chicago, architect.

INDIANA

EVANSVILLE, IND.—Seeger Refrigerator Co., 225 W. Morgan St., has awarded a $1 million contract to M. J. Hoffman Construction Co., 1011 Hulman Bldg., for construction of a plant near Garvin Park; Carr & Wright, 330 N. Michigan Ave., Chicago, architect.

INDIANAPOLIS—Glidden Co., 1160 W. 18th St., has awarded a $3 million contract to Chemical Plants Division, Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, for construction of a plant.

KANSAS

KANSAS CITY, KANSAS.—Colgate-Palmolive Peet Co., 105 Hudson St., Jersey City, N. J., will build a $2 million manufacturing plant.

LOUISIANA

NEW ORLEANS—American Radiator & Standard Sanitary Corp., 846 Baronne St., will build a $1.4 million plant.

MASSACHUSETTS

CHARLESTOWN, MASS.—Boston Wholesale Food Terminal Corp., c/o Worcester Engineering Co., engineer, Faneuil Hall Market Bldg., Boston, will build a $2 million terminal, Rutherford Ave.

MICHIGAN

DETROIT—General Motors Corp., 2-153 General Motors Bldg., will build a $50 million research center; Argonaut Realty Division, General Motors Corp., 304 General Motors Research Bldg., engineer and architect.

MINNESOTA

MILACA, MINN.—Rural Co-operative Power Association of Maple Lake, Minn., will build a $500,000 power generating plant.

NEW JERSEY

CLIFTON, N. J.—Yardley of London Inc., 620 Fifth Ave., New York, will build a $1.5 million factory.

JERSEY CITY, N. J.—Standard Laundry Co., 951-89 Garfield Ave., will build a $200,000 laundry building.

RARITAN TWP., N. J.—Johnson & Johnson, 500 George St., New Brunswick, N. J., will build a $1,185,000 warehouse and office.

NORTH CAROLINA

WILMINGTON, N. C.—Lloyd A. Fry Roofing Co., 5818 S. Archer St., Chicago, has awarded a $750,000 contract to Campbell-Lowrie-Lautermilch Co., 400 W. Madison St., Chi-

cago, for construction of a plant for producing asphalt composition roofing.

NORTH DAKOTA

BEULAH, N. DAK.—Montana-Dakota Utilities Co. has awarded a $1 million contract to Stearns-Roger Mfg. Co., 1720 California St., Denver, for construction of a power plant changes and equipment.

OHIO

CLEVELAND—Park Drop Forge Co., manufacturer of crankshafts for diesel motors, will soon begin construction of a $100,000 addition to its machine shop on E. 79th St.

MANSFIELD, O.—Farm Tools Inc., A. Schott Bros. operation, has purchased the agricultural line of Harvey Mfg. Co. Inc., Racine, Wis., for $1 million, and soon will announce distribution of a complete line of air compressors to the farm trade.

YOUNGSTOWN—Falcon Bronze Co. is building a $420,000 addition to its S. Phelps St. plant.

PENNSYLVANIA

ERIE, PA.—Northern Steel Corp. has been chartered by Brooks, Curtze & Silin, attorneys, 610 Marine Bank Bldg., to buy, sell, deal and trade in, smelt, manufacture, fabricate, process and convert new, old and reclaimed iron, steel, ferrous and nonferrous metals and alloys, paper products and similar articles and materials.

PITTSBURGH—Mine Safety Appliance Co., Braddock Ave., has awarded a $500,000 contract to Navarro Corp., 6219 Broad St., for construction of a laboratory.

TENNESSEE

CHATTANOOGA, TENN.—Hailey Chevrolet Co., c/o Clarence T. Jones, architect, James Bldg., will build a $150,000 auto sales and service building.

KNOXVILLE, TENN.—Glazer Steel Corp. is considering installation of a steel furnace and rolling mill.

MEMPHIS, TENN.—Plough Inc., 132 S. Second St., will put $150,000 in a plant addition.

NASHVILLE, TENN.—Methodist Publishing House, Demonbreun St., has awarded a $1 million contract to R. C. Mathews, Third National Bank Bldg., for construction of a printing plant.

CANADA

KOOTENAY LAKE, B. C.—Yale Lead & Zinc Mines Ltd., 330 Bay St., Toronto, Ont., will build a $160,000 diamond drilling and mine development project; owner builds, B. W. W. McDougall, c/o owner, engineer.

AJAX, ONT. — Viscose Products Co. has awarded a $750,000 contract to Milne & Nicholls Ltd., 57 Bloor St. W., Toronto, for construction of a plant; N. A. Armstrong, 19 Melinda St., Toronto, architect.

MONTREAL, QUE.—Le Petit Journal, 1242 St. Denis St., has awarded a $180,000 contract to R. Hamelin, 354 E. St. Catherine St., for construction of a plant; E. Cormier, 3675 Cote des Neiges Rd., architect.

MONTREAL, QUE.—Montreal Motor Works Ltd., 5790 Notre Dame St. E., has awarded a $300,000 contract to Anglin Norcross Quebec Ltd., 892 W. Sherbrooke St., for construction of a plant; S. Comber & Son, 4444 Sherbrooke St. W., architect.

MEXICO

MEXICO CITY, MEX.—Southern Pacific Railroad plans rehabilitation lines, spending $18,400,000 for laying heavier rails, strengthening and renewing bridges.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Continued from Page 153*)

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90c; ton lots 21.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Odd 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.90c per lb of alloy, ton lots packed 10.3c, 200 to 1999 lb 10.65c, smaller lots 11.15c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅜ lb each and containing exactly 2 lb of Cr.). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.l. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.0c, per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: Ti 17-21%, C 3-4.5%). Contract, $175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open-Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, freight allowed. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c, freight allowed.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W. or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W., $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, Spot add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60% Mn 5% max. Si 8% max, C 0.5% max.). Contract, ton lot 2" x D, $2.90 per lb of contained Cb, less ton $2.95. Delivered. Spot, add 25c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6% Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr. 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lo 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8% Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, to lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% Fe 20% approx.). Contract, carload, packed ½" x 12 M, 16.5c per lb of alloy, ton lot 17.25c, less ton 18.5. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 16.50-17.00c per lb of alloy ton lots 17.90-18.00c; less ton lots 19.40-19.50c f.o.b. Niagara Falls, N. Y.; freight allowed t St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19% Mn 8-11%). C.l. packed, 14.25c per lb o alloy; ton lots 15.75c; less ton lots 17.00c f.o.b., Niagara Falls, N. Y.; freight allowe to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 11c, ton lots 11.25c smaller lots 11.75c per lb alloy; freight no exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of above or below the base): Gross tons per carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington Pa., furnace, any quantity $1.10.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.